The Cotton Gin and Oil Mill

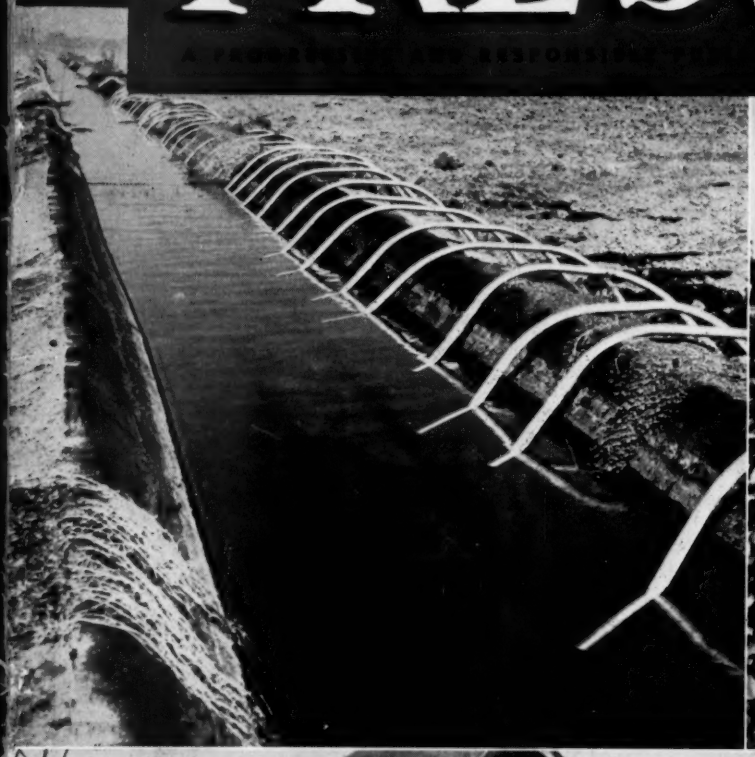
PRESS

FEBRUARY 12, 1955

56th year

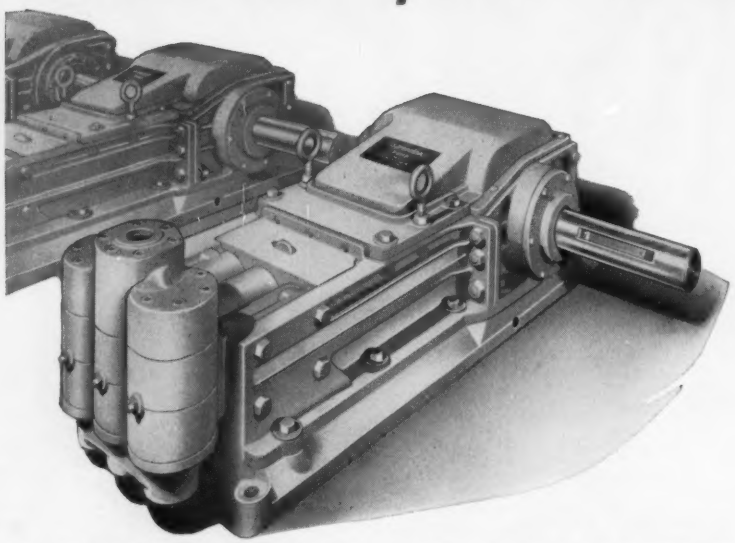
THE MAGAZINE OF THE COTTON GINNING AND OILSEED PROCESSING INDUSTRIES

A PUBLICATION DEVOTED EXCLUSIVELY TO THE COTTON GINNING AND OILSEED PROCESSING INDUSTRIES



Special BETTER PRODUCTION PRACTICES *Issue*

LUMMUS *Speedex* HYDRAULIC PUMP



It is new. It has capacity enough for two or three rams. Completely enclosed, self-lubricated. Roller bearing crank-shaft. Insert type connecting rod bearings. Permanent type packing. Engineered for long, trouble-free service. A truly modern pump. Write for Bulletin #642 which has all the details.

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Lummus is doing more to put gins on a better paying basis.

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HEAT TREATED GIN SAWS

Easier to Train—Stay Trained Longer—Last Longer

Our new heat treated gin saws have proved through several years of field testing to be outstandingly superior in durability and performance to ordinary gin saws. Approximately a **million** CONTINENTAL heat treated saws are in use in practically every cotton producing area of the world.

This important new development helps ginners everywhere to cope with present day demands for better samples, greater capacity and all around higher efficiency.

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Continental GIN COMPANY

BIRMINGHAM, ALABAMA

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a new **HIGH**

in the art of seed-cotton preparation

After years of research and months of extensive field tests, MITCHELL now brings you the SUPER CHAMP . . . a highly efficient new feeder-extractor-cleaner.

By the combination of three revolutionary principles, the Super Champ achieves a truly NEW HIGH in quality of performance. At the same time, it has tremendous capacity. Get full details and our new color brochure on the Super Champ.

1955

MITCHELL

Super Champ

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DEPENDABLE MILL EQUIPMENT

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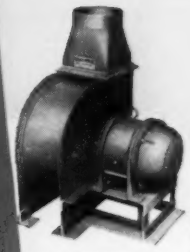
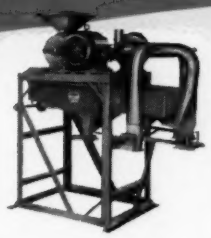


Grain Blower & Exhaust Fan

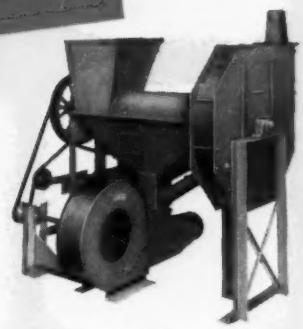
Vertical Screw Elevator

Cob Crusher for making Poultry Litter

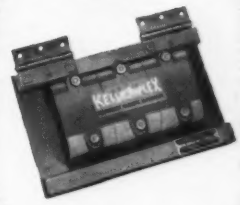


Corn Cutter and Grader with Aspirator

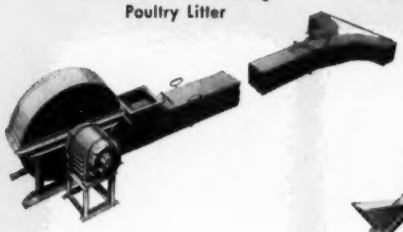
Vertical Feed Mixer ½ to 5 tons and larger



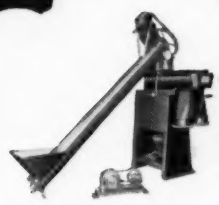
Corn Sheller with blowers for grain and cobs



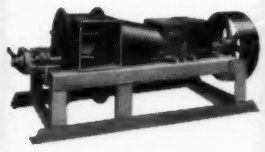
Magnetic Separator protects mill machinery



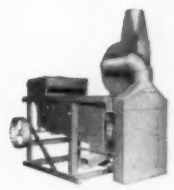
Forced Air Carloader with motor or belt drive



Twin Molasses Mixer

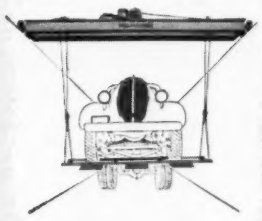


Regular and Pitless Corn Shellers

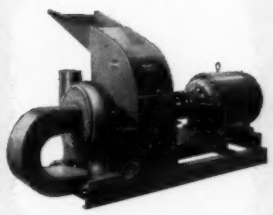


Corn Scalper with or without air cleaner

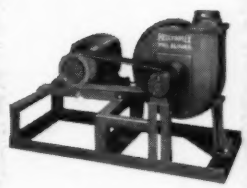
Chain Drag in double and single geared types



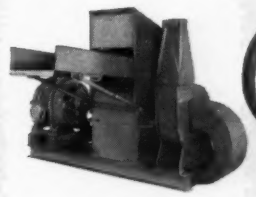
Electric Truck Hoist cuts handling costs



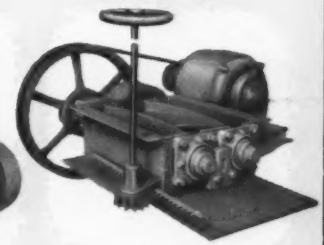
Model "M" Hammermill with direct connected motor



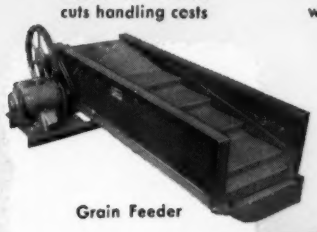
Attrition Mill Blowers for any size plant



Model "S" Wide Throat Hammermill



Corn Crusher and Feed Regulator



Grain Feeder

GUARANTEE

We will gladly ship you any Kelly Duplex machine on approval. If it is not completely satisfactory, you are free to return it within 30 days after arrival at destination, by prepaid freight, for refund of full purchase price. In addition, each Kelly Duplex is guaranteed against defects in material and workmanship for 90 days.

The Duplex Mill & Manufacturing Company Springfield, Ohio

Yes, I'm interested in the KELLY DUPLEX machinery checked at the right. Please send me full information on these machines without any obligation.

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KELLY DUPLEX

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- ☐ Vertical Feed Mixer
- ☐ Model "S" Hammermill
- ☐ Model "M" Hammermill
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- ☐ Cob Crusher
- ☐ Corn Cutter and Grader
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- ☐ Regular Corn Sheller
- ☐ Pitless Corn Sheller
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- ☐ Grain Feeder
- ☐ Grain Blower
- ☐ Twin Molasses Mixer
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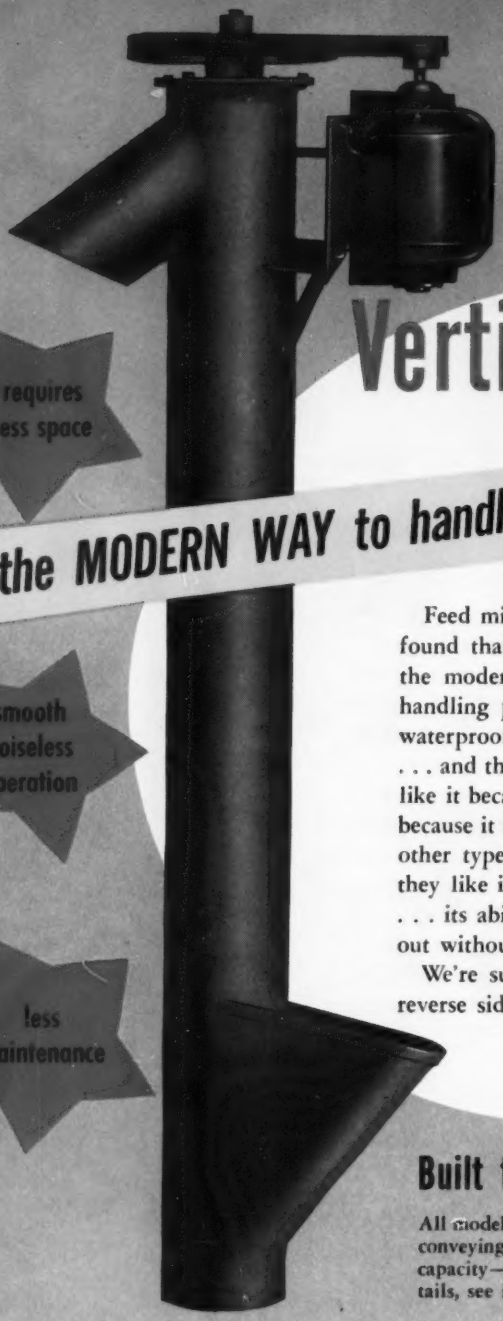


KELLY-DUPLEX

Vertical Screw Elevator

requires less space

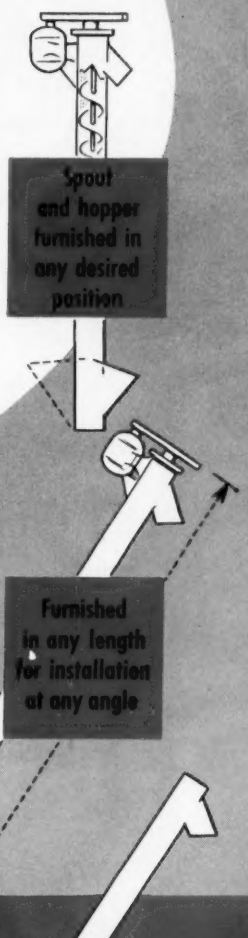
smooth noiseless operation

less maintenance

the MODERN WAY to handle grain and free-flowing materials

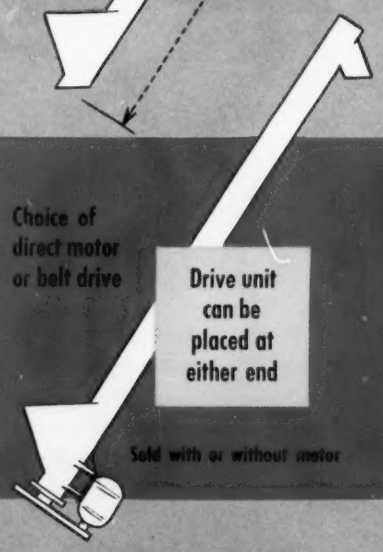
Feed mill and elevator men all over the country have found that the Kelly Duplex Vertical Screw Elevator is the modern, money-saving solution for every material handling problem. They know that it's dustproof and waterproof . . . that it reduces accident and fire hazard . . . and that it requires less space, is easy to install. They like it because it's smooth and noiseless in operation . . . because it assures efficient, uniform delivery of grain and other types of free-flowing bulk materials. Best of all, they like it for its rugged, all welded steel construction . . . its ability to give top performance year in and year out without costly breakdowns and repairs.

We're sure that you'll like it, too. Check coupon on reverse side of this sheet for full details.



Built to your specifications

All models furnished in choice of 6", 9" or 12" conveying tubes. Hoppers are available in any capacity—spouts in any length. For other details, see illustrations at right.



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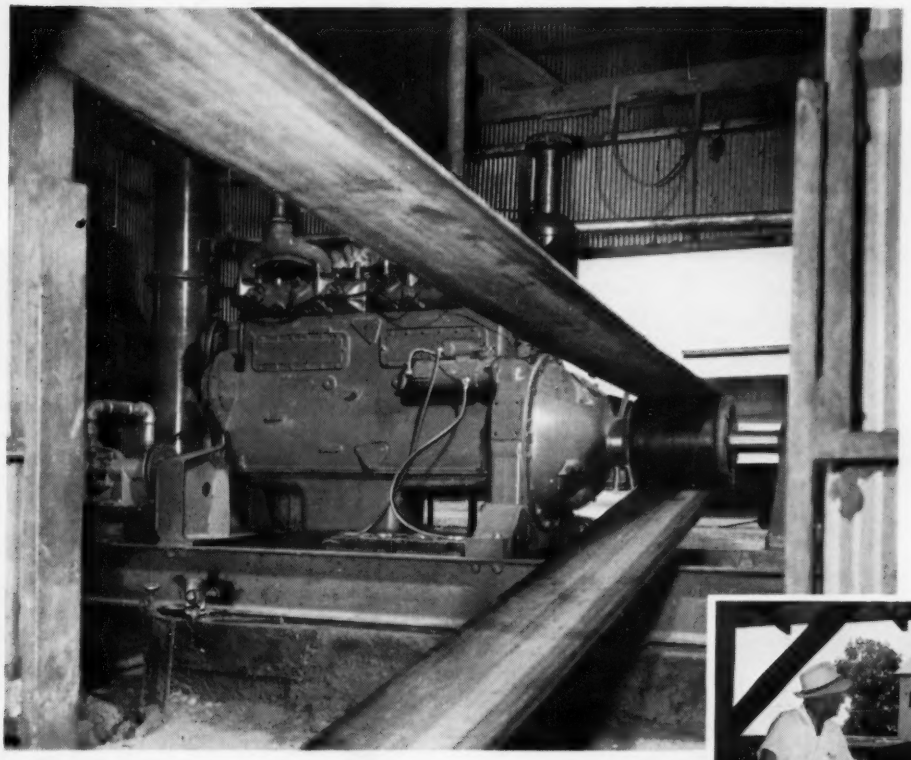
17-Year-Old IH Gin Engine Replaced by U-1091



RUNNING AT TWO-THIRDS THROTTLE, this INTERNATIONAL U-1091 natural gas burning engine powers the 4-70 gin stand, including 4,000,000 B.T.U. drier, impact cleaner and separators for L. L. Paxton.

FOR NEARLY TWO DECADES, L. L. Paxton, shown in foreground, powered this gin with a 100 hp. INTERNATIONAL PD-80 diesel, replaced it reluctantly when changeover in gin setup required additional power.

Mississippi gin owner adds equipment, puts 200 HP. U-1091 in place of old PD-80 diesel that ginned more than 60,000 bales

An ancient 17-year-old INTERNATIONAL PD-80 diesel engine finally had to be replaced in the L. L. Paxton cotton gin at Wilmot, Mississippi—not because it was worn out or not delivering peak performance, but because the owner needed more power to drive extra equipment added to gin machine-picked cotton.

Addition of an impact cleaner, a drier and an extra separator was too big a load for the old PD-80, but the new 200 HP. INTERNATIONAL U-1091 gin engine handles the load easily running at two-thirds throttle and holds ginning power costs to 70¢ per bale.

Gin owner Paxton handles approximately 3,000 bales during a 3½-month season with the U-1091—but the PD-80 remains a legend around the gin where it ginned more than 60,000 bales in 17 years.

If you've been pampering the power unit that drives your gin, check with your nearby INTERNATIONAL Industrial Power Unit Distributor or Dealer for the full facts on the savings you can make next season in production and operating costs with an INTERNATIONAL. He sells and services a complete line of 18 INTERNATIONAL diesel and carbureted gin engines—one exactly right for your power requirements. Call him today.

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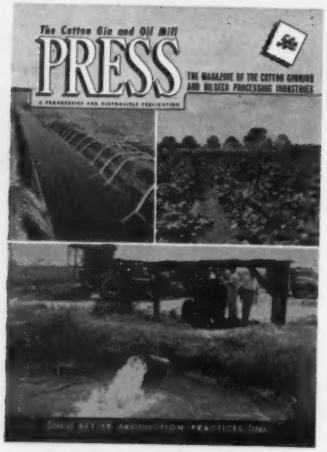
INDUSTRIAL POWER
MAKES EVERY LOAD A PAYLOAD



★ ON OUR COVER:

Irrigation—supplemental and as virtually the only source of moisture—is playing an increasing role in cotton production, and is featured in this special issue devoted to better production practices. Scenes on the cover show the use of irrigation as a supplement to rainfall in the Midsouth and as the principal source of water in the Far West.

Photographs by The Cotton Council and The Cotton Gin and Oil Mill Press

VOL. 56 FEBRUARY 12, 1955 NO. 4

The Cotton Gin and Oil Mill PRESS...

READ BY COTTON GINNERS, COTTONSEED CRUSHERS AND OTHER OILSEED PROCESSORS FROM CALIFORNIA TO THE CAROLINAS

★ ★ ★

OFFICIAL MAGAZINE OF:

National Cottonseed Products Association

National Cotton Ginners' Association

Alabama Cotton Ginners' Association

Arizona Ginners' Association

Arkansas-Missouri Ginners' Association

California Cotton Ginners' Association

The Carolinas Ginners' Association

Georgia Cotton Ginners' Association

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Tennessee Cotton Ginners' Association

Texas Cotton Ginners' Association

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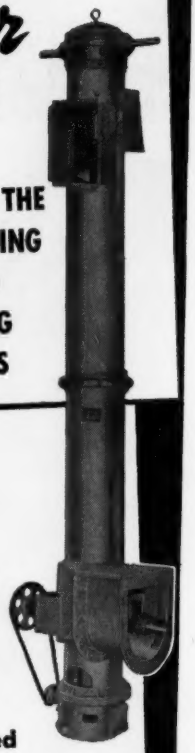
A PROGRESSIVE AND RESPONSIBLE PUBLICATION

GENUINE SOUTHWESTERN

Rotor Lift

PREFERRED IN THE COTTON GINNING & OILSEED PROCESSING INDUSTRIES



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Such a marked preference for Rotor Life is natural. Replacing bucket elevators and other mechanical elevating units. Precision engineered to meet your needs and requirements in the elevating of any free flowing bulk material, the Rotor Lift will give you uninterrupted production and a continuous reduction in operating cost. Rotor Lift is available in nine distinct types and four diameter sizes. When processors in the cotton ginning and oilseed industries express such enthusiasm, it is well worth your investigation.

Send for our illustrated catalog describing the mechanical feature and specifications of the Rotor Lift.

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SPRAY YOUR COTTON WEED TROUBLES AWAY!

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Niagara

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THIS PRE-EMERGENCE WEED KILLER

SAVES COSTLY HAND HOEING

OVER A FOUR TO SIX WEEK PERIOD

You give your young cotton a four to six week weed-free start when you spray seed beds with Niagara Chloro IPC Miscible immediately after planting. *No costly hoe hands are required during this period.*

In addition to saving money initially on labor you stand to make more money at picking time by using this material. That's because your young cotton will germinate, sprout and flourish without fighting the weeds for nourishment and moisture. You'll raise bigger, healthier plants that produce a better yield.

Niagara Chloro IPC Miscible is easy to apply—simply attach the sprayer to the back of your planter. For economy you need only treat the planted rows with a narrow band of the solution 12 inches wide.

The effectiveness of Niagara Chloro IPC Miscible is a matter of record in many Southern experiment stations where it has been thoroughly tested and proved. It is ready now to save money and make money for you. Ask for Niagara Chloro IPC Miscible by name at your dealers.

Get the ***"Niagara Chloro IPC Weed Control Guide,"*** a 16-page booklet with the answers to your questions, and complete directions for profitable Weed Control. See your Niagara Dealer or write Department A, Middleport, N.Y.

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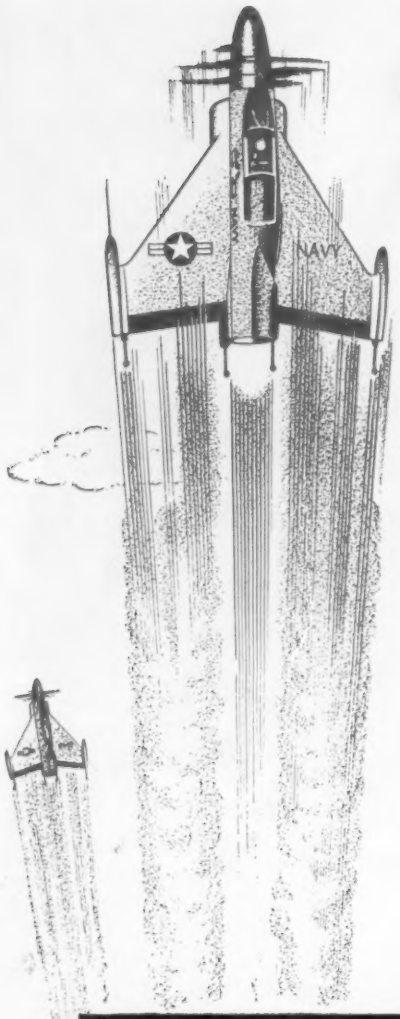

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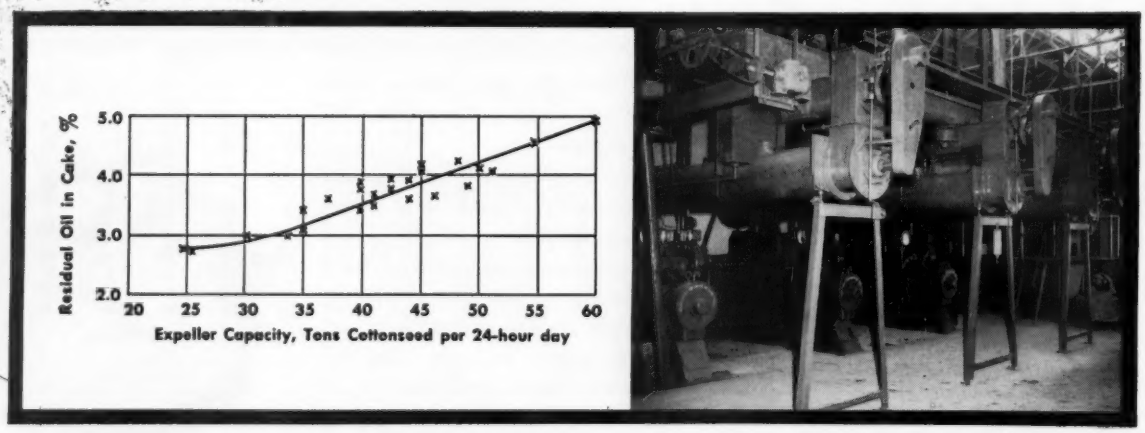
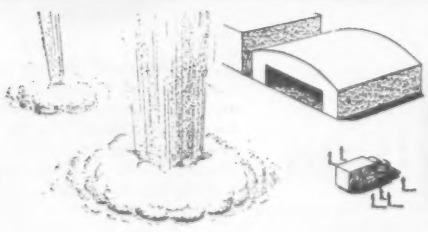
HEAVY DUTY *HIGH CAPACITY* EXPELLERS

Processes 950 to 2400 Lbs. Cake per Hour!—25 to 60 Tons per Day!
Residual Oil 2.8% to 4.95%!

● These results are positive proof that Anderson's new Heavy Duty High Capacity process is tops in performance. The X's on the graph represent 25 cottonseed oil mills, each obtaining results best suited to their own particular conditions. With results and flexibility like those below, plus production of an oil comparable in quality to hydraulic oil, you can see why over 50 cottonseed oil millers switched to the new High Capacity Expeller Process. Plan now to obtain these results in your own mill. Write, wire or phone for an Anderson engineer to survey your situation without obligation.



Heavy Duty, High Capacity Expellers,
Stamford Cotton Oil Mill, Stamford, Texas



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JUNIOR ACHIEVEMENT WEEK—JAN. 30—FEB. 5

What water can do is illustrated by this picture, taken last December near O'Brien, Texas. S. N. REED (extreme right), cotton farmer, seed breeder and past president of Texas Cotton Ginners' Association, shows friends six acres of new Northern Star No. 11 cotton he planted as a demonstration. Watered every 10 to 12 days from a 50-foot-deep, 4-inch well, and dusted every 7 days to control insects, the six acres made 18 bales. As a result of this evidence of the value of irrigation and systematic dusting, farmers of the area will drill between 150 and 200 new wells to irrigate cotton in '55.

Water Makes the Difference

Many of the better production practices essential to efficient cotton farming are discussed in this special issue. It takes them all to do the job, but no practice can pay its full dividends without water. Here is what farmers are doing to see that this water is available.

MORE COTTON FARMERS used better production practices in 1954 than ever before. Some made record yields. Others had very low production or crop failure. Water was the difference, in most cases.

There's nothing new in drouth. But it is news when a region makes the highest acre yield of its principal crop during what has been called the worst drouth in six centuries. And the real news rests in the fact that so much of the water that made the crop was man-made—supplemental or complete irrigation.

What the weather will bring in '55, or any other year, no man knows. But many a cotton grower promised himself this year that he's going to have some water in the future. He's not going to be caught short again. Wherever you go, from the Carolinas westward to the cotton growing area that is entirely dependent upon artificial watering, you hear more discussion of irrigation than any other single factor in cotton production.

• **It Makes Other Practices Pay**—Practices that are essential for profitable cotton production are outlined throughout this special issue of The Cotton Gin and Oil Mill Press. To emphasize one at the expense of another would be foolish. All are important. They are interdependent. The best farmers have been and will in the future be those who wrap them all together in a package.

It is obvious, though, that even a crop as drouth-resistant as cotton takes water to produce. The record is equally clear as to the fact that practically every year, practically anywhere in the Cotton Belt, there are drouths of varying intensity. That's why so many farmers in the more humid areas are hitching up to a nearby creek, drilling a well and installing irrigation equipment. That's why water is mentioned so often in connection with the other practices summarized in this issue. That's why irrigation is being discussed at the beginning of this issue.

• **Irrigation Survey** — It's doubtful whether anyone knows exactly how much cotton was irrigated in 1954, or will be irrigated next season. You hear all sorts of different estimates, across the Belt or within individual states. Sam Reed's cotton irrigation demonstration, pictured on this page, shows why no one knows exactly how many acres are irrigated. Reed's neighbors saw the plot, as he hoped they would, and they expect to drill 150 to 200 wells to water their 1955 crops. But who knows whether it will be 151, 162 or 201?

To obtain the best available information, The Press has made a special survey in cooperation with authorities of USDA, the land grant colleges, experiment stations, extension services, and other authoritative sources of information. So far as we know, this is the first time such information has been published for the Belt as a whole.

The comments of these authorities follow. They represent a valuable contribution to knowledge about the growing trend to produce cotton through irrigation. But, most of the authorities probably would agree with the statement that the farmers are ahead of all the rest of us.

There's going to be even more cotton irrigation in the future, whenever it's needed, than our records show, and that will make all of the other better pro-

By WALTER B. MOORE
Editor, The Cotton Gin And Oil Mill Press

duction practices—all essential to a well-rounded farming program—more productive and more profitable.

• **Alabama**—There is considerable interest in using supplemental irrigation on cotton in Alabama, and a few farmers in the Tennessee Valley tried it in 1954. There are, however, no reliable estimates of acreage or results.

The Alabama Experiment Station plans to do some research on cotton irrigation in the Tennessee Valley this year. In the past, irrigation research in Alabama has been confined to horticultural crops, corn and forage crops.

A regional fundamental research project to study irrigating forage crops at Thorsby, Ala., is getting under way. This work is a joint endeavor of the Alabama Experiment Station and the Soil and Water Conservation Branch of USDA.—*Howard T. Rogers, Head, Department of Agronomy and Soils, Alabama Polytechnic Institute, Auburn.*

• **Arizona**—All cotton produced in Arizona is, of course, grown with the aid of irrigation water. Continuous increase in yields for the past few years has been attributed to a combination of better water and soil management, more efficient use of fertilizers, advances in disease and insect control, and plant breeding.

Past research on soil and water management has shown that a deep preplanting irrigation on Arizona soils is important for controlling salt accumulation and for providing moisture for late-season cotton growth.

Low humidity and high temperatures make it generally desirable to give a late May or possibly a June irrigation on cotton to control temperatures. After this, the plants are large enough to shade the soil and irrigations are used only to supply consumptive needs of the plants.

Tests were made in 1954 on timing and frequency of irrigations. Seven irrigation schedules were utilized, and each was given a preplanting irrigation. Four were given limited (three) irrigations and the other three were given more water (from five to seven applications). The preplanting irrigation amounted to one foot of water, and each subsequent irrigation added five inches.

Yields were above average on this year's experiment. Yields reported here were determined by using a linting percentage of 32 percent on Pima S-1 and 36 percent on Acala.

Highest yields for both Arizona Acala 44 and Pima S-1 were obtained with six irrigations. Arizona Acala 44 yielded 1,999 pounds of lint per acre under this treatment, and Pima S-1 yielded 1,537. The irrigation schedule was as follows: May 25, June 22, July 8, July 29, Aug. 19 and Sept. 9.

Using an additional, later irrigation did not benefit yields. In fact, total produced with seven waterings was 1,908 pounds per acre of Acala and 1,484 pounds per acre of Pima S-1. Lowest yields were obtained under the limited water schedules that received only three waterings. The average was about 1,465 pounds for Acala and 1,114 pounds of Pima S-1 per acre.—*Leonard J. Erie and Karl Harris, Soil and Water Conservation Research Branch, ARS, USDA, cooperating with Arizona Experiment Station.*

• **Arkansas** — Arkansas used supplemental irrigation on 270,000 acres of cotton in 1954, compared with about 16,000 acres in 1946. Irrigated yield (1.82 bales per acre) at the Arkansas Experiment Station, Marianna, last year was 85.7 percent better than for non-irrigated cotton.

During the early part of July, cotton used water at the rate of about .32 inch per day. This amount dropped as the season progressed, but it it was still above .2 inch daily until Sept. 1.

Effect of irrigation on cotton grown on subsoiled land was studied in 1953 and 1954. Subsoiling did not increase cotton yield either year.—*Billy B. Bryan, Assistant Professor, Department of Agricultural Engineering, University of Arkansas, Fayetteville.*

• **California**—All of California's cotton acreage is irrigated, and irrigation practices are well established for the various areas and soil conditions. Practically all cotton land is pre-irrigated; and these are rather heavy irrigations, from six to 10 inches of water which will penetrate to a depth of six feet.

Pre-irrigations are usually in the form of a flood irrigation or furrows placed very closely together to approach the flooded condition. After planting, most cotton is irrigated by furrows between the rows, and a small acreage is flood irrigated.

Flood irrigations take place on extremely heavy soils and alkali and saline soils. Small acreages of cotton are

(Continued on Page 54)

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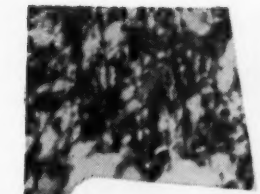

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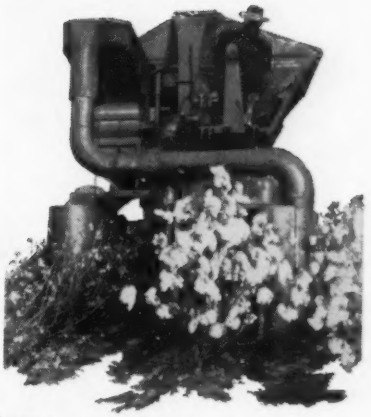

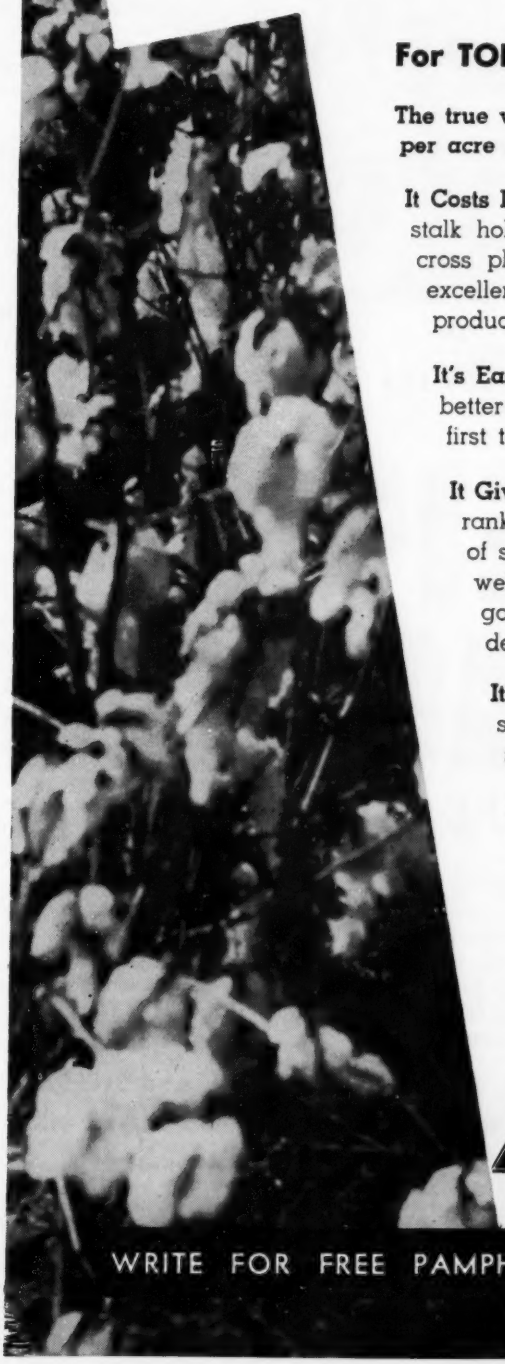

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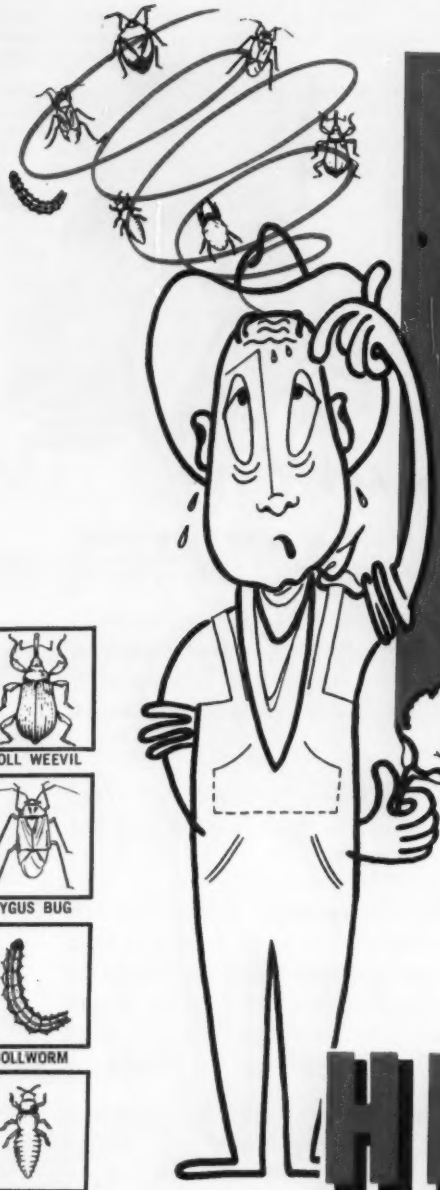

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Whether we like it or not, the industrial revolution continues to bring change, to cotton culture as well as to other things. This brings new problems in genetics research.

Challenge to Breeder

By JAMES R. MEYER

JAMES R. MEYER is Cytogeneticist, Field Crops Research Branch, ARS, USDA, and Mississippi Delta Branch Station, Stoneville.

WE NEED cheaper cotton and better cotton. We need cottons with more yield and stronger lint. We need to lower the cost of producing each bale of lint and, at the same time, improve the quality of that lint if we want our cotton to compete in price and quality with other fibers and other markets.

Many people are working toward raising cotton yield levels and thereby lowering the cost of production. The agronomists, entomologists, pathologists, soils and fertilizer experts, agricultural engineers, agricultural economists, extension workers and many others tell us how to do a better job of preparing the land, selecting the variety, and growing and harvesting the crop in the most efficient manner. All are interested in helping us get more lint per acre. But the prime responsibility for improving lint yield rests with the cotton breeder. We all know that we cannot get 1955 performance from a 1940 model.

Modern cotton varieties are great improvements over their parental types, but whether we like it or not, cotton culture is being transformed by the industrial revolution, and there are important new breeding problems that need to be solved.

• **The Hybrid Problem**—Results at the Tennessee Experiment Station and at the Delta Branch of Mississippi Experiment Station, in cooperation with USDA scientists, show that hybrid cottons yield more than other cottons. The greatest obstacle to the commercial production of hybrid cotton rests in the fact that the male and female organs are not separated into tassels and ear shoots as in corn. They are both in the same flower and it would require far too much careful hand labor to produce the F_1 hybrid seed. There are many difficulties involved in utilizing hybrid vigor in cotton, but the fact remains that hybrid cotton does show promise for improving cotton yields. If suitable male-sterile inbred lines can be produced, hybrid cottons can become a reality.

Breeders have always been interested in producing better cotton. Never before has the need for better cotton been so great and never before have so many tools been available for improving cotton. The new instruments for measuring fiber properties are indispensable in modern cotton-improvement work. Recent studies by geneticists and cytologists show that there is a great reservoir of potential breeding material in the wild and cultivated species. Cotton species work is one of the most promising and, at the same time, one of the most exasperating fields in the agricultural world today.

The studies of many people, and especially those of the late Doctor Beasley at the Texas Experiment Station, have shown us how the different wild cotton species are related to each other and to our American upland cotton. Recent studies show that these species possess many plant and fiber properties of great potential value—if we can learn how to move or transfer these properties into good productive upland cotton.

• **No Simple Task** — The successful transfer of a valuable property from a cotton species to good upland cotton is no simple task. A few species can be grown in the field, but most of them require special greenhouse conditions. The seeds are hard to germinate. The seedlings die easily and require special watering and care. Most species bloom only during the short days of winter. Many species shed their leaves and squares very easily, and it is hard to produce flowers. Most species are difficult to cross with upland cotton, and if one is fortunate enough to obtain hybrid plants, they are usually completely sterile; that is, the hybrid plants do not set any seeds and will not cross with upland cotton.

Fortunately, many of the most valuable plant and fiber properties are in species which are rather closely related to our upland cotton. The late Doctor Beasley showed us how to use mixed pollination and embryo culture and the drug, colchicine, to produce cotton species hybrids with seeds and pollen. Therefore, if we can devise suitable new breeding techniques, it would be possible to make use of at least some of this great reservoir of germ plasm in the wild cotton species.

It is known that our upland cotton originated from a chance combination of a linted Asiatic cotton species with a lintless American cotton species. These two species somehow got together and produced hybrids, and somehow the chromosome number of the hybrids became doubled. These hybrids with twice as many chromosomes as the two parental type species became the progenitors of our modern cotton.

• **Many Properties Available** — Two groups of cotton species, the linted Asiatic and the lintless American, which gave rise to upland cotton and which are therefore closely related to it, offer the cytogeneticist and breeder many valuable plant and fiber properties for the improvement of our upland cotton.

Recent studies indicate that the Asiatic cottons have many valuable characteristics. Some of these are: lint strength, lint coarseness, earliness, boll prolificacy, drouth resistance, resistance to boll weevil, resistance to nematodes, resistance to Verticillium wilt, and open or flaring bracts. (The bracts are the three leafy organs around the square and boll; flaring bracts should enable insecticides and sunlight to make the squares and young bolls less desirable places for boll insects.)

The lintless American species have breeding potentialities for lint strength, for a thin rod-like type of fiber, boll prolificacy, drouth resistance, resistance to boll weevil, resistance to nematodes. small or open or shedding bracts, and over-all plant smoothness, or D_2 Smoothness, as we now call it.

• **Genes Can Be Moved** — The late doctor Beasley showed us how triple hybrids—plants containing complete sets of chromosomes from upland and Asiatic and lintless American cotton species—could be produced. This is one method that enables us to start transferring a characteristic from an Asiatic or a lintless American species to upland cotton.

Recent cooperative federal and state work at the North Carolina Experiment Station and at the Delta Branch Experiment Station has shown how a definite gene or charactistic can be moved from an Asiatic or lintless American species to upland cotton. These two systems—using the latter or so-called pentaploid system, or beginning with a triple hybrid — seem to be the most promising ways to start using the Asiatic and lintless American species for improving our upland cotton. Both methods are tedious and difficult and require a long time.

Some triple hybrids can be self-pollinated or inbred to start populations of field plants; but usually, whichever system is employed, the triple hybrid or pentaploid, the basic species hybrids have to be crossed back on upland cotton to gain plant types with enough fertility and production to be usable in a field breeding program.

• **Smooth Cotton Promising** — D_2 Smoothness is a very promising, perfectly smooth type of cotton which is being developed at the Delta Branch of the Mississippi Experiment Station. Plants with D_2 Smoothness have absolutely smooth (hairless) stems, leaves, and bracts. This new characteristic was transferred from a wild, lintless American species, *Gossypium armourianum*, to upland cotton.

D_2 Smoothness is very simply inherit-

ed; it is due to one partially dominant gene. It is very easy to use in a cotton-breeding program and seems to offer great promise of helping to solve the trash and lint-cleaning problems of mechanically harvested cotton. This new characteristic was found in 1951. By the use of new breeding techniques and the winter growing facilities for cotton at Iguala, Mexico, it was possible to have D_2 Smoothness "built into" rather good forms of upland by 1954.

There do not seem to be any especially bad or deleterious characteristics coming along with D_2 Smoothness into good cotton—in fact some of the new strains seem to have greater boll prolificacy than the upland cottons used in their production and two of the new strains that are pure-breeding for D_2 Smoothness had 42.5 percent lint in 1954. One of the latter strains is being grown at Iguala, Mexico, for multiplication and as a source of pollen for any cotton breeders or geneticists who wish to use its pollen on their breeding material there this winter.

Some of the other breeding materials at the Delta Branch Experiment Station show promise of being a source of lint strength, lint coarseness, flaring bracts, dropping or deciduous bracts, earliness, and prolificacy.

The species of cotton offer undreamed of possibilities for the improvement of American upland cotton. But, it will take a lot of work and the united efforts of many specialists before we can tap and utilize many of these breeding potentialities.

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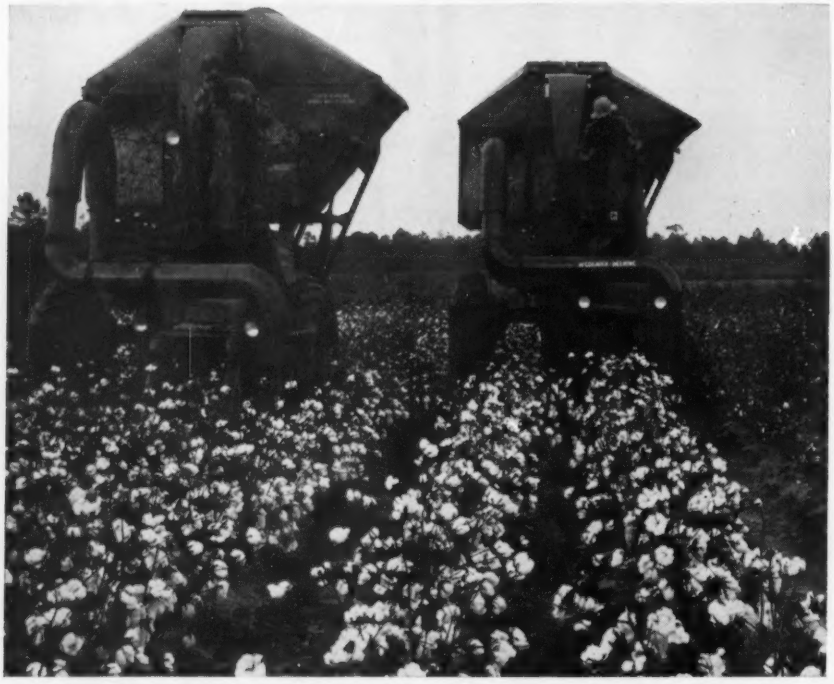

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Irrigation Clinic Program Set

■ TEXAS Cottonseed Crushers' Association among sponsors of one-day irrigation meeting.

Plans have been announced for an irrigation clinic to be held at Arlington State College, Arlington, Texas, Feb. 17. The event will be sponsored by the college, The Progressive Farmer, Radio Station WFAA, Dallas, and Texas Cottonseed Crushers' Association.

Eugene Butler, Dallas, president and editor of The Progressive Farmer, will preside at the morning session. An address of welcome will be made by Dr. E. H. Hereford, president of the college, following which Butler will explain the purpose of the meeting.

C. B. Spencer, Dallas, agricultural director of the Texas Crushers, will talk on effects of irrigation and fertilization on cotton yields, and R. W. Sundstrom, district engineer of the U.S. Geological Survey will discuss the underground water supply.

Also scheduled to talk during the morning session are Judge Otho Dent, State Board of Water Engineers, whose topic will be legal restrictions concerning water use; Charles Richter, Farmers Home Adminstration, who will talk about help available for planning and financing irrigation facilities; and W. O. Trogdon, Olin Mathieson Chemical Corp., who will discuss using fertilizer profitably with irrigation.

Time will be allowed during the lunch period for viewing exhibits. Murray Cox of Radio Station WFAA will preside at the afternoon session. Roy Garrett of Texas Experiment Station, College Station, will talk on supplemental irrigation in the higher rainfall belt of Texas, and J. C. Gaines of Texas A. & M. will discuss insect problems arising from use of irrigation.

Luther Bird of the Texas Experiment Station is scheduled to present information on disease problems arising from use of irrigation, and three farm editors will interview farmers about their experiences with irrigation. The three are Doc Ruhmann, Radio Station WBAP, Fort Worth. A. B. Jolley, Radio Station KRLD, Dallas, and Murray Cox, Radio Station WFAA, Dallas.

Summarizing the program and presiding at the question and answer session will be G. G. Gibson, director of Texas Extension Service.

Need Is More Markets, Says J. Earl Coke

J. Earl Coke, director of the California Extension Service and formerly Under Secretary of Agriculture for Ezra Taft Benson, said recently that farmers' real problem is to find markets for the tremendous harvests still being produced as the result of stepped up operations during wartime.

Farmers, he continued, must "readjust" their productions to get "more in line with the demand" and also must increase markets, both at home and abroad. One of the principal needs is building up export trade, he said.

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"Better production practices" is not a catch phrase. The cotton producer must keep up with developments to survive. There is no room for inefficiency today.

Culture for the King

By WILLIAM L. GILES

WILLIAM L. GILES is Superintendent of the Delta Branch of the Mississippi Experiment Station.

GREATER EFFICIENCY is the theme of most current articles and meetings dealing with agricultural production. Even a hurried glance at costs of the machines, materials, and labor required to produce a crop of cotton reveals that the current value of the product leaves small margin for inefficiency. Efficient production is not just a catch phrase; it is a requirement for survival of the cotton producer.

The farmer with one pair of mules who produces cotton as the sole source of income for his family is rapidly passing from the American scene. The farmer's sons and daughters have been in the armed forces and have worked in factories. They want for their families modern homes and a higher standard of living. If they stay on the farm, they want time for off-the-farm employment for supplemental income. Efficient mechanized production is a means of attaining these desires.

Complete mechanization in cotton production will be, but has not yet been, attained. Any degree of mechanization in cotton production is still relatively recent; therefore we have much to learn regarding combinations of machines and practices which will result in the most efficient production of the crop. Unfortunately, mechanization and efficient production are not necessarily synonomous. To paraphrase General Forrest's immortal axiom, "We need to get the mostest with the leastest."

Anyone who has followed a truck load of cottonseed on a highway must have observed that the road shoulders are heavily seeded to cotton each fall. In spite of these annual seedings through most of the Cotton Belt, we seldom see volunteer cotton, indicating that the cotton plant thrives only under cultivation.

Through cultural practices, man attempts to develop an environment for the cotton plant which will result in the maximum production of lint. Each operation during the growing season should be aimed toward influencing the increased production of mature, open bolls. This is an elementary statement, yet unnecessary trips through the field made through habit and tradition frequently result in excessive production costs.

This article will deal with three phases of cotton culture: preplanting operations, planting and thinning, and cultivation. Articles dealing with fertilization, insect control, defoliation, mechanical harvesting, and other phases of cotton production will be found in this same issue of The Cotton Gin and Oil Mill Press.

Preplanting Operations

Preplanting operations may begin immediately after harvest of the previous crop. The care with which the residue of the previous crop is prepared for turning under will influence the ease with which the following crop can be planted and cultivated. Power-driven stalk cutters or shredders, available in several sizes, do an efficient job of disposing of above-ground crop residue. These same machines are useful for clipping weeds in pastures and on roadways. Straw choppers on combines do an excellent job of both cutting and spreading soybean and small-grain straw.

Stubble and roots of cotton, corn, and sorghum are troublesome at planting time. The Feb. 27, 1954, issue of The Cotton Gin and Oil Mill Press pictured a cotton root slicer which will help solve the root and stubble problem.

Where cotton is grown under irrigation, land leveling is a standard preplanting operation. This practice has application throughout the Cotton Belt and is too frequently overlooked. Growers in the rain-grown section of the Belt sustain heavy losses almost every year due to broken stands in low spots.

An irrigation engineer flying over the lower Arkansas River Valley a few days after a rain estimated that 15 percent of this fertile, relatively level land was taken up by wet spots. Wet places in fields slow up planting and cultivation and may result in heavy losses from delayed harvest where mechanical pickers are used. Increasing interest in supplemental irrigation in the Midsouth and Southeast will help promote land leveling as a practice. Whether or not the crop is irrigated, land leveling is essential for an efficient mechanized operation.

There are a number of land-leveling devices available which are adapted to use with the larger farm-type wheel tractors. These implements should be used when the soil is relatively dry. If heavy cuts and fills are made, the operation should be far enough in advance of seedbed preparation to permit flat-breaking the land.

Once a field is level, care should be taken to keep it level. One plowing improperly laid out can undo a perfect leveling job. The two-way or reversible plow is invaluable for maintaining a level land surface.

Results of numerous experiments dealing with subsoiling or deep tillage have been reported. A survey of these experiments indicates more cases where deep tillage did not result in increased crop yields than cases where this practice was a definite benefit. Like many other questions concerning a subject as varied as our soils, generalization is not in order.

A series of deep tillage experiments at the Delta Branch Station, indicates definite benefits from deep-breaking for the past three years. On a fine, sandy loam soil with a hardpan, chiseling or plowing 12 inches deep increased cotton yields as much as 1,665 pounds of seed cotton per acre. Observations indicate that deep tillage will have no influence on cotton yields on a heavy clay soil which cracks deeply when dry.

Where a compacted layer of soil of limited thickness exists below the surface and within the root zone of the cotton plant, subsoiling or deep tillage will likely pay. Digging a hole in the ground 18 or 24 inches deep is a quick check for the existence of this condition. The tillage need only be deep enough to shatter the compacted layer. Depths of 12 to 18 inches will likely correct most hardpan conditions which can be practically corrected mechanically.

Deep tillage should be done when the compacted layer is rather dry to increase shattering. This operation should be performed far enough in advance of planting to allow rain or irrigation water to fill the root zone.

Prior to bedding, cotton land is usually disked. The disk is a fine implement to destroy winter and early spring weeds and to cut surface trash into the soil, but is also a packing device. Disking can be and quite frequently is overdone.

Fertilizers for cotton are usually applied in connection with the bedding operation. Application of all the fertilizer for the crop just prior to planting will save a trip through the field in midseason, has a marked advantage from the standpoint of weed control, and may supply nutrients which would not be available from a side-dressing in dry soil. Under certain soil conditions, it is not profitable to apply all the fertilizer prior to planting.

Bedding is the method of seedbed preparation commonly used for cotton. Uniformity of row spacing and shape of beds are extremely important. It is difficult to plant and cultivate unevenly-spaced rows with multiple-row equipment. Uneven row middles result in loss of cotton where the crop is machine-picked. Time spent in carefully adjusting the row marker will pay dividends. Middle-breaker bottoms can be accurate-

(Continued on Page 76)

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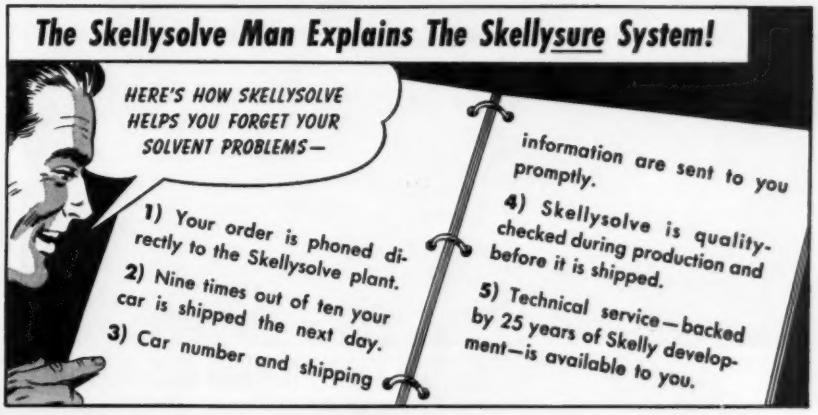
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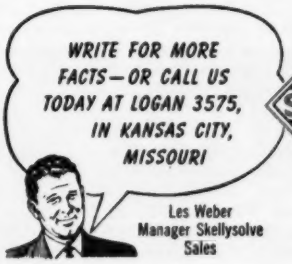

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• More States Name Ginners of Year

THE FOLLOWING leaders have been selected by their respective states as ginner of the year and nominated for the national award of the Horace Hayden Memorial Trophy. The Press published in previous issues biographies of ginners whose selections were announced earlier.

North Carolina

Myres W. Tilghman of Dunn, N.C., has been named as North Carolina ginner of the year for 1954. His selection was unanimously approved by the industry in North Carolina. He has long been a leader in the cotton industry in the Carolinas and is held in highest esteem by both customers and competitors, the announcement pointed out.

His completely modern gin, seed delinting, and bonded warehouse storage facilities give an all round service to the cotton producer. His cooperation with the classification office, USDA, and his assistance to his farmer customers are outstanding.

Tilghman is recognized as a leader in his community and serves as chairman of the Dunn Hospital Board. He was formerly a member of the Dunn Board of Commissioners, and is presently serving on the Dunn Planning Board.

As president of the Carolinas Ginners' Association, he made many contributions to the ginning industry in the Carolinas and spent much time attending meetings within the states and committee hearings in Washington and other points throughout the Cotton Belt.

As a charter member and director of the North Carolina Cotton Promotion Committee, Tilghman has been a leader in reawakening interest in the cotton industry in the Carolinas.

He has also found time to build the strength of his church. In a community near Dunn where a church was greatly needed, he spent much time in securing a proper building and then as Sunday School superintendent.

In the small community of Angier, where the only cotton gin was being abandoned, Tilghman modernized the plant and provided quality ginning in the area.

A summary of some of his activities includes: past president and director, Carolinas Ginners' Association; past director, National Cotton Ginners' Association; delegate member, National Cotton Council; director and charter member, North Carolina Cotton Promotion Committee; member, fire prevention and control committee, National Cotton Council; past president, Four County Ginners' Group, North Carolina; elder, Presbyterian Church, Dunn; superintendent, Sunday School, Baersville Presbyterian Church; member, Masonic Order; chairman, Dunn Hospital Board; member, City of Dunn Planning Board; former commissioner, City of Dunn; president, General Utility Co., and partner, Lucknow Clothing Co., Dunn and Angier.

Oklahoma

Elmer Dawson, manager, Farmer's Co-Operative Gin, Mt. View, Okla., has been selected as the ginner of the year in Oklahoma.

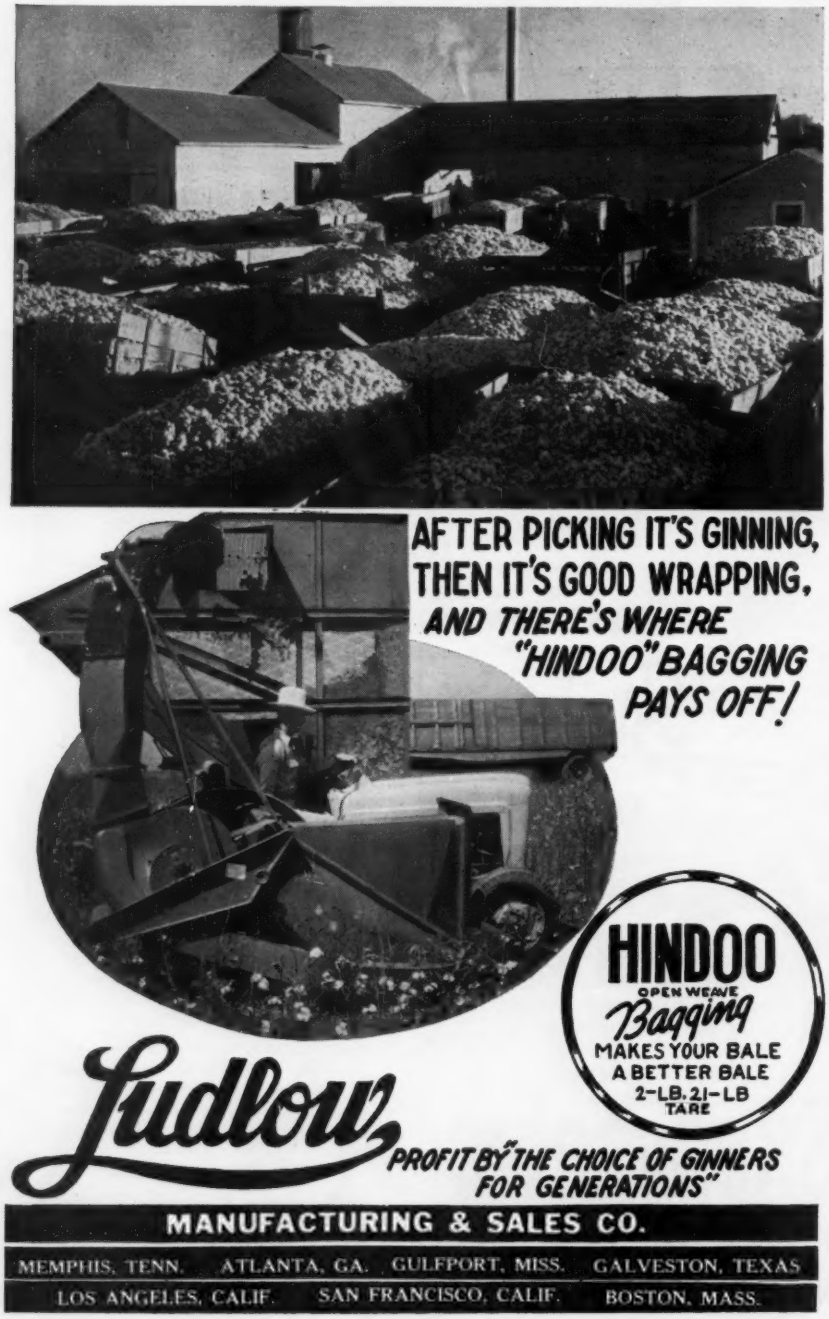
Dawson is chairman of the agriculture committee of the Mt. View Chamber of Commerce and member of the Rotary Club serving on the agriculture committee. He arranged and sponsored four programs with local farmers on improved methods of cotton production and conservation last season. He obtained specialists from the Oklahoma A. & M. College to meet with the farmers. He is continually working with and for an improved agriculture community.

Members of the Baptist Church, he and Mrs. Dawson are class mother and father for the Senior Class in Mt. View. He is a great booster of the local Township Fair and works more than 10 hours a day during the fair to insure its success. He also helps keep up the city park. Dawson helps raise funds for local 4-H and FFA programs and sponsored a cotton production contest for these boys. He helps to finance the band and raised funds to send the Future Homemakers to Florida last year. He devotes his time and efforts to community projects and contributes generously, the announcement commented.

Dawson, with his board of directors, has one of the most modern and best-equipped cotton gins in the Belt. He has the latest drying and cleaning equipment available. He turns out a high quality product for his customers under some of the roughest harvesting methods. This gin is kept in top operating condition, and he has well trained employees that observe strict safety precautions at all times. He installed a steam sterilizer to permit his customers to return cotton burs to the land and at the same time abide by pink bollworm quarantine.

During the growing season he makes regular field inspections for cotton insects. When situations present themselves that he cannot handle, he calls on the staff of specialists from Okla-

(Continued on Page 26)



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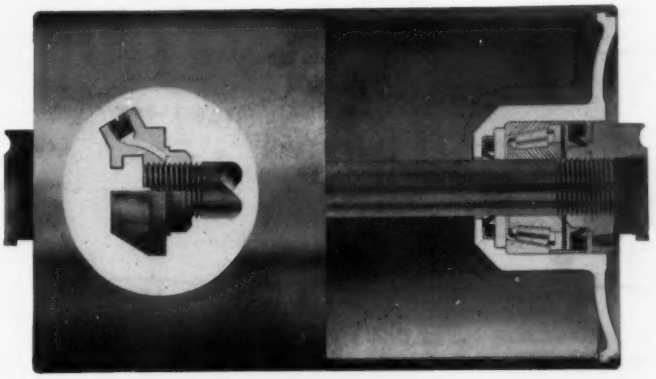

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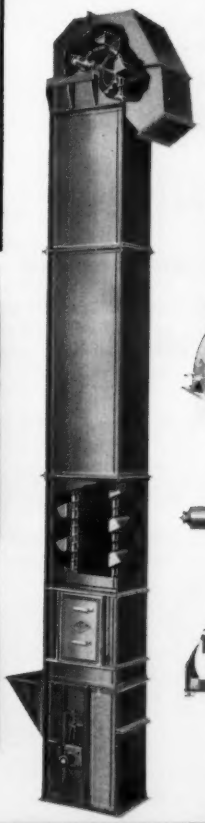

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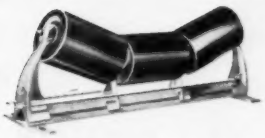
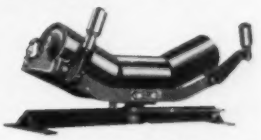


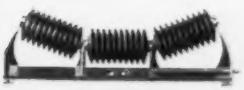
Standard Troughing Idlers



Self-Aligning Troughing Idlers

Space Disc Idlers

Self-Aligning Return Idlers



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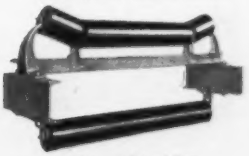

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Soil Fertility, the Key To Profitable Farming

New techniques have forced a scientific, businesslike approach by farmers, and precision fertilization is a "must" for maximum returns.

By RUSSELL COLEMAN

REGARDLESS OF variations in soil, climate, topography, and other factors having a direct influence on growing any crop, certain standard procedures have universal application in the efficient and economic production of that crop.

Take cotton, for example. The National Fertilizer Association, in a recently published summary of tips for growing cotton, points up the following measures:

1. Prepare a good seedbed.
2. Select a recommended variety.
3. Plant heavily—thin properly.
4. Plant on time.
5. Knock out weeds.
6. Fertilize heavily.
7. Control pests.
8. Follow a sound crop rotation.
9. Use a pre-harvest defoliant.
10. Pick cotton early.

A closer look at these general recommendations reveals that, with two exceptions, they are not so different from pointers which might have been made 10, 25, or 50 years ago. The methods employed in carrying out these generalizations, however, have changed radically.

We all agree that profitable, efficient farming cannot be a slap-dash, shot-in-the-dark affair. Today, and increasingly more in the future, it is a science and a cold dollar-and-cents business. Modernization of farming techniques—particularly in mechanics and chemistry—has forced the scientific, businesslike approach. What's more, present trends indicate that agriculture as a whole, and cotton growing in particular, must continually take this approach in the future.

For instance, look at the farming methods of Thomas R. Coleman of the Delta area of Mississippi. His fields are rated high in organic matter and are typed as silty loam. The pH, as tested in 1953, is 5.6.

Coleman, a former 4-H Club member, entered the 1954 Five-Acre Cotton Contest with the title of top Mississippi cotton grower of the 1953 season with 1,650 pounds of lint per acre. Using recommended practices and a goodly share of common sense, Coleman was co-winner of the 1954 crown, too. He raised 4.22

(Continued on Page 74)

This crop followed 24 years of pasture. After four or five years in cotton, the land will be returned to pasture, says DOCTOR COLEMAN (below, right), president of the National Fertilizer Association, Washington.

Take a Bigger Profit Share of Every Bale...

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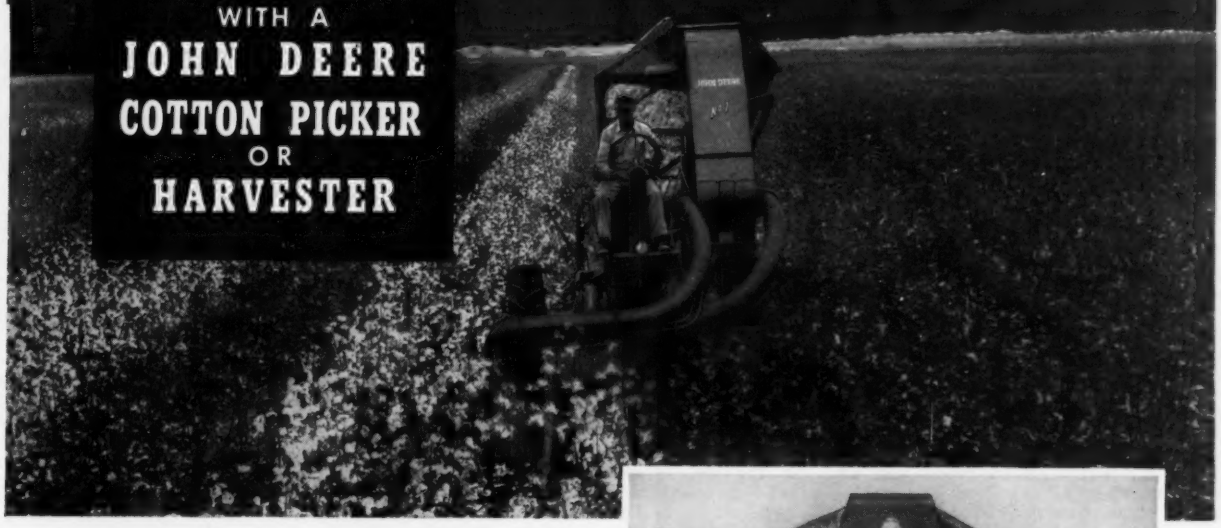

MANY dollars slip through the fingers of cotton growers at picking time—dollars that can be saved on every bale with a John Deere Cotton Picker or Harvester.

For those growers depending upon hand labor, there are tremendous savings. For owners of ordinary harvesting equipment, there are real savings in reduced operating costs, upkeep costs, and "down" time.

Cost-cutting mechanization is within easy reach of every cotton grower. On the average acreage of open-type cotton, the John Deere No. 1 *One-Row Mounted* Picker pays off in greater cotton savings and faster harvests. The No. 1 replaces 40 or more hand pickers—picks up to an acre per hour. It mounts on John Deere "50," "60," "70," or late Model "A" and "G" Tractors with no costly tractor conversions.

On larger acreages, the famous John Deere No. 8 *Two-Row Self-Propelled* Cotton Picker picks up to 1-3/4 acres per hour—replaces 70 or more hand laborers. The No. 8 does nearly twice the work of one-row machines with additional savings in fuel and operating expenses.

In storm-proof cotton, the outstanding John Deere No. 15 *Two-Row Mounted* Cotton Harvester strips bolls clean in a once-over operation—pays for itself over and over again.

Take a bigger share of every bale for yourself. See your John Deere dealer. Mail coupon today for free literature.

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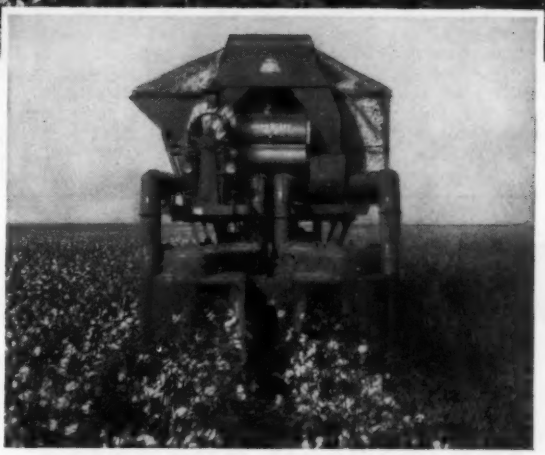

The John Deere No. 1 One-Row Mounted Cotton Picker is shown in the large picture above; the No. 8 Two-Row Self-Propelled Picker in the smaller picture. Picking two rows at a time from both sides of each row, they do a real cotton-saving job.

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Has Been Gilt-Edged Investment

Council Is Facing Historic Decision, Durand Says

■ **OPPORTUNITIES are ahead for expanding cotton's markets, retiring president tells annual meeting; but it will take increasing activities and adequate financing to carry them on.**

THE COTTON INDUSTRY, which has profited from its gilt-edged investment in the National Cotton Council since 1939, faces a historic decision today. That decision is whether it will provide the financing required for expanded activities necessary to cash in on its future opportunities.

This was the warning which A. L. Durand, Hobart, Okla., 1954 president and now chairman of the Council board of directors, gave industry members on Jan. 31 at the opening session of the annual meeting in Houston. Because of its importance to ginners, crushers and others in the industry, his address is published here, in addition to the other information about the Council meeting elsewhere in this issue. He said:

It is my privilege to bring you an annual message as president of the National Cotton Council. This is the one and only time that I shall ever do so. The Council now chooses a new president every year. One year in every two, the president will be from the producer interest. Every other year, he will be chosen from the other five interests in rotation. For the first year, we insisted that Harold Young, who is a producer, remain in office. For the second year, which is now drawing to a close, it has been my honor to serve as president.

It is a matter of real pride with me that I have been in this organization from its beginning. I believe the Cotton Council is the most important and hopeful thing that has happened in this industry during my lifetime. Being asked to serve as the first president from a non-producer interest is a signal honor and responsibility. I appreciate it deeply, and have tried to live up to it. Oscar Johnston and Harold Young before me have worked hard at the job. I am confident that our future presidents will do likewise. It can be truthfully said that I have guarded jealously that principle which is the foundation of our charter and bylaws—namely, that the Council acts only on those policy matters which have been officially approved by each of the six interests that comprise our whole organization.

The expanding influence and prestige of the organization is a tribute to the great man who served us as president during the first nine years of the Council. Last May, the ground was broken and construction started on a fine building to be erected in honor of Oscar Johnston. It will be completed around the middle of 1955. Owned by the Oscar Johnston Foundation, the building will be leased to the Council. It will house the entire activity of our headquarters office at Memphis.

• **Significant Meeting**—It falls my lot to preside over one of the most important meetings in the history of the Council. We are gathered for a great deal more than the usual business of an annual meeting, important as that is. This is the meeting at which our delegate members will face the question: Is the total program of the Council adequate for the purpose for which it was established?

For some years a good many of us have been wrestling with that question. We have seen it grow bigger. On 16 years of solid experience, we now know beyond any doubt that the Council can do some important jobs for our industry. We know, in fact, that through the Council our industry has turned back the tide of synthetic competition which was threatening to destroy our markets. Through the Council we have found a method of successful cooperation for our whole industry, from farmer to spinner and from coast to coast, in the great fields of research and promotion. Our big question now is: Are we putting enough money into the Council for it to do the job it should do in the future?

(Continued on Page 65)

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On all chemicals always follow directions for application. Where warning or caution statements on use of the product are given, read them carefully.

More cotton means more money for the farmer. Here is a resume of what one state is doing to bring this desirable result.

The 7-Step Program

By T. M. WALLER

COTTON is a taprooted plant and is well adapted to a majority of soils in the six major soil type farming areas of Mississippi. We shall continue to encourage farmers who like cotton to follow Step 1, "Fit Cotton into a Balanced Farming Program," in each of the soil areas.

Eighty percent of Mississippi's farmers grow cotton on approximately 30 percent of the crop land. For good land use and sound statewide economic conditions, cotton should be planted on two million acres in Mississippi in 1955.

We are proud that, from 1946 through 1954, sale of cotton lint and seed account for an average of 65 percent of total cash farm income from all crops and livestock. In 1946, 54 percent, and in 1954, 74 percent of Mississippi farm income was derived from cotton. Since 1946, the 7-Step Cotton Educational Program has done much to prove that Mississippi farm income can be increased by increasing cotton yields per acre.

Increased yields have been largely responsible for this substantial increase in farm income from cotton. Farmers know from experience that tough, poorly-drained buckshot land should never be planted to cotton for economical yields per acre. Research findings have proved this, also. All the land on a farm is not adaptable to machinery, especially at the time the practice needs to be done. Proper field layout, row arrangements, drainage, etc., are necessary for more use of machinery and higher yields. The farm plan should include other enterprises to suit your likes and available labor.

Cotton production & yield per acre—Mississippi

Year	Harvested acreage	Production 500 lb. gross wt. bales	Lint yield per harvested acre
	(000)	(000)	Pounds
1948	2,383	2,353	437
1949	2,730	1,487	261
1950	2,049	1,340	315
1951	2,340	1,608	329
1952	2,375	1,885	385
1953	2,490	2,145	413
1954	1,950	1,645	387
Average	2,331	1,780	361

The 7-Step Cotton Educational Program pointed the way to wider use of a complete program in timely application of all experiment station research findings. Mississippi farmers have been able to practice better land use during recent years. Soil and water conservation practices have been followed since farmers have a higher farm income.

• **Step 2**—"Take Care of Your Soil," requires good management in land use, drainage or terracing, fertilization and many other necessary improved practices.

It requires 72 pounds of nitrogen, 39 pounds of phosphate and 59 pounds of potash to produce a bale of cotton, stalks, roots, leaves, stems, burs, seed and lint. We sell seed and lint; therefore we should utilize the stalks. If shredded and turned under after harvest, this matter is worth $7.50 per acre in fertilizer equivalent. This practice also reduces damage from seedling diseases.

As soon after harvest as possible, plant (drill) a cover crop broadcast to protect soil from erosion. Over a period of 22 years at the Stoneville Experiment Station, hairy vetch plowed under two weeks before planting increased the yield of seed cotton 1,080 pounds per acre, compared with no cover crops. Soil must have water-holding capacity. Control the rate of flow of water in cotton fields with row arrangement.

Test soils for amount of fertilizer needed. In the Delta, 90-120 pounds of nitrogen (either in the form of liquids or solids) should be used for maximum yields per acre. Proper insect control will set fruit as it is formed; and a loaded plant usually is dwarfed and matures earlier. Four to five weeks after the cotton plants start fruiting, 95 percent of the bolls harvested are set.

In the hills, the general recommendations are to apply 600 pounds of a mixed fertilizer and side-dress with an additional 35-40 pounds of pure nitrogen per acre. On those soils low in potash, add an extra 25-30 pounds K_2O per acre. The soil test results may show a need for lower or higher rates for certain fields.

• **Step 3**—Farmers who cooperate on Step 3, "Get Together on the Best Local Variety," are helping to maintain high quality cotton production. Mississippi cotton farmers are in business to make money by producing superior cottons for textile markets of the world. Those days are gone when farmers could give a farmhand a mule, middlebuster, planter, double shovel and hoe and get one-half to one bale of cotton in return. During those days county agents had figures to show that 3.5 workers per family were able to plant, chop and pick an average of 12 acres of cotton. The plantation had its own gin, and old Uncle Joe took his time ginning each bale just right. Each family loved their cotton. They picked it clean and dried it out in the sun and in cotton houses before Uncle Joe received it at the gin. The farmers took high grade, long and strong staple cotton to the markets. Spinners all over the world wanted Mississippi cotton.

Right here in Mississippi, four of the world's best breeders have kept up with the requirements of both farmers and spinners and have outstanding cottons. We are fortunate in this respect.

All the acreage on a farm should be planted to seed of one variety. Each gin should gin seed cotton of only one variety. Farmers can keep planting seed genetically pure and can guarantee to the mills pure fiber as to variety. This also lessens the ginner's problems—one adjustment of machinery to suit one size of seed and length of staple. All seed cotton would be from the same uniform variety of cotton. There would be no problem of seed mixing at the gin.

Today cotton breeders sell farmers planting seed of a given variety with known agronomic and spinning properties. Mississippi certified seed growers supply high quality pure seed to cotton farmers in the U.S. and foreign countries. The kind of seed planted determines the kind of lint put into the bale at the gin and enables the spinner to weave the kind of end product desired.

• **Step 4**—During the past 20 years, Step 4, "Make Your Labor and Equipment Count," has helped farmers to feed 17 city people, as compared to six people in town in 1930. Industrial development drew labor to large cities and small towns. The city worker could make more in a few months than the farm

(Continued on Page 67)

Mississippi—THE COTTON STATE

Mississippi is, if any state is, THE COTTON STATE. Midway between the East and West, it shares the practices and problems of both regions. Its Delta is unsurpassed in richness; its hill lands resemble areas of many other parts of the Belt. Its people, as much as any people anywhere, think in terms of cotton and depend on the lint and seed for their livelihood.

For these reasons, and also because of the outstanding record that the state is making in cotton improvement, Mississippi's application of the 7-Step Program has been chosen to illustrate the work that is being done in all of the Cotton Belt along these lines. Readers in any state will find in this thoughtful article information that will be useful in cotton improvement.—*Editor.*

T. M. WALLER is Associate Agronomist-Cotton with the Mississippi Extension Service.

Water Prospects Are Poor In New Mexico Basins

Below average precipitation in the major watersheds of New Mexico for the year ending Dec. 31, 1954, is reflected in the reservoir storage data released by the U.S. Department of Commerce Weather Bureau, Albuquerque.

Two dams on the Pecos River, Alamogordo and Red Bluff, held more water on Dec. 31, 1954, than on Dec. 31, 1953. Other dams showed considerably lower levels.

Following are the number of acre feet held by the various dams on Dec. 31, 1954, and comparative figures for 1953:

Reservoir	Storage as of Dec. 31, 1954	Storage as of Dec. 31, 1953
Conchas Dam	145,089	167,223
Alamogordo Dam	79,205	23,383
Red Bluff Dam	161,600	34,420
Elephant Butte and Caballo Dams	115,100	124,750

The San Juan and Northwest watershed received 93 percent of normal precipitation from Jan. 1 to Dec. 31, 1954. Figures for other watersheds for the same period are as follows: Canadian and Northeast, 73 percent, Pecos and Southeast, 84 percent, Northern Rio Grande, 78 percent, Southern Rio Grande, 75 percent, and Gila and Southwest, 78 percent. New Mexico had 80 percent of normal precipitation for the year ending Dec. 31, 1954.

The water supply forecast, based on prospective runoff in the various basins also looks very gloomy, according to a report from the Albuquerque Weather Bureau and Soil Conservation Service. The current water outlook is for water-year runoff of from 65 to 85 percent of average for most of the Rio Grande Basin. For the Rio Chama and the lower main stem of the Rio Grande, somewhat lower percentages are indicated; inflow into Elephant Butte Reservoir is expected to be near 45 percent of the 10-year average.

Domestic Mills Present Views to Committee

American Cotton Manufacturers' Institute representatives emphasized the importance of domestic textile markets to U.S. cotton growers in testimony during January before the House Ways and Means Committee on proposed extension of the Reciprocal Trade Act.

Mill spokesmen argued that there was a danger that lower tariffs could weaken the domestic industry and reduce raw cotton consumption.

Dairy Buying Declines

For the first time since December, 1952, USDA bought no butter during December, 1954. Price support purchases of cheese and dry milk also were small during the final month of last year. Cheese buying was at the lowest monthly level in two years and dry milk purchases were the smallest except for those of November, 1954.

Peanut Supply Is Down

Supply of peanuts held in off-farm positions at the end of 1954 totaled 640 million pounds. This is about one-half the amount on hand at the close of 1953.

More Profit FROM Less Cotton Acreage!

FOR YOUR PROTECTION
READ the TAG
BEFORE YOU BUY!
1st Year from Mississippi Certified Breeder's Registered Seed
GROWN ON ONE VARIETY FARMS
GINNED ON ONE VARIETY GINS

Plant MISSISSIPPI CERTIFIED COTTONSEED for *High Yield* and *Top Quality*

When you plant Mississippi Certified Blue Tag Cottonseed you are sure it is **only one year from registered stock.** To guarantee you quality seed, every bushel of Mississippi Certified Cottonseed is **grown on one variety farms** and **ginned on one variety gins.** Each step from production to final labeling is under the supervision of qualified agronomists and competent inspectors. That's why Mississippi Certified Cottonseed is a premium cotton which will make you **more profit from less acres.**

This Emblem on the **BLUE TAG** *is Your Guarantee of Certified Cottonseed* **ONLY ONE YEAR** *from Breeders' Registered Seed.*

Place Your Order With Your Seed Dealer Today.

For a list of Seed Growers write:

MISSISSIPPI SEED IMPROVEMENT ASS'N.
(A.A.L.) STATE COLLEGE, MISSISSIPPI

More States Name Ginners of Year

(Continued from Page 18)

homa A. & M. College or solicts help from one of the oil mills which keep qualified men in the field aiding cotton insect control.

Dawson's record of service to his customers, the volume of ginning and net earnings at the end of the season are evidence of his managerial ability. He has a consistent record of showing a profit at the end of each year's operation, which is a great tribute in view of extremes of weather in Oklahoma. Many seasons, the Mt. View community is flooded at some time during planting season and then has a drouth.

His gin has always been a member of the Oklahoma Cotton Research Foundation and has never failed to collect and pay 10 cents per bale to the National Cotton Council.

He has been a director of the Oklahoma Cotton Ginners' Association for four years. He was vice-president of the Association for the 1953-54 season and is now the president of the state group. In addition, he is a Oklahoma delegate to the National Cotton Council, a director of the National Cotton Ginners' Association, a member of the Oklahoma Agricultural Advisory Council, and a member of the Oklahoma Cattlemen's Association and on their advisory committee.

Virginia

O. K. Hobbs, of Suffolk, has been selected as Virginia's ginner of the year and is described as the operator of the most modern gin in the state.

Although cotton production has been decreasing steadily in Virginia for the past few years, there is a small nucleus of progressive men who are fighting to keep cotton in Virginia. These are the ginners of Virginia. Among them is a young man who began in the ginning business in a brand new gin in the season of 1953.

He and his partners faced the situation of reduced acreages and still opened a new, completely equipped cotton gin. The principal aim was to bring better gin services to the area and encourage better cultivating practices as well as mechanical harvesting.

Hobbs' chief interest outside of his ginning business and his family is working in his electrical and machine shop in his home. He has built several devices which are in the process of being patented. An outstanding automatic device for operating cotton gins has been patented and sold to one of our major gin machinery manufacturers.

It is rare for a young man to enter a new field and develop the interest and following in such a short time, the announcement points out. Hobbs' contributions to cotton production in his area and his outstanding gin services have brought him recognition from citizens in his area and from other ginners in Virginia and North Carolina.

He and his family are very active in the church affairs of the community and are members of the Suffolk Baptist Church. He is a member of American Legion Post 57, the Kings Fork Ruritan Club, and the Eastover Civic Club. Since entering the ginning business, he has been a firm supporter of the Carolinas Ginners' Association and has participated in all the activities of the National Cotton Council of America. He is also a member of the Virginia Farm Equipment Association.

New Mexico

Winston Lovelace, Loving, N.M., has been selected as New Mexico's ginner of the year in recognition of his leadership in the ginning industry, civic activities and other outstanding qualifications that meet the standards announced by the National Cotton Ginners' Association.

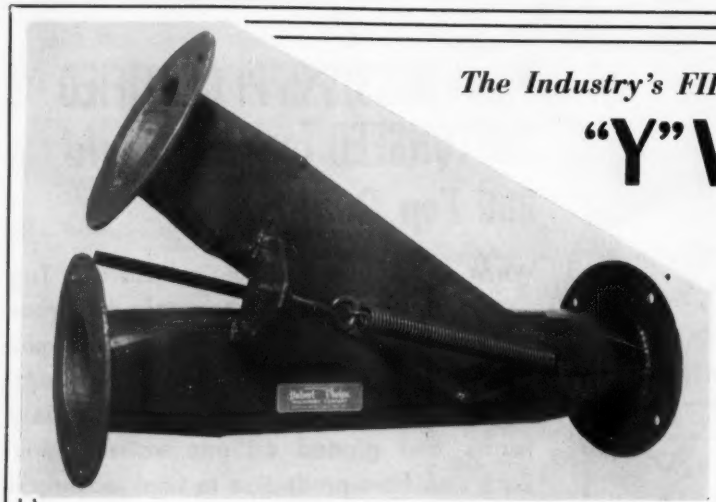
Acknowledging the fact that practically everybody claims to have been born on the farm, Lovelace confesses to having been a "city boy" in view of the fact that he was born in Hobart, Okla., July 31, 1908. He was educated principally in Holy Trinity parochial school, Dallas, and University of Dallas academy but did attend the University of Texas for a while.

Lovelace was employed by Quanah Cotton Oil Co., Quanah, Texas, from 1928 to 1944, going at that time to Otis Gin and Warehouse Co., Loving, N.M., the firm which he still manages and which was reorganized as Pecos Valley Cotton Oil Co. in 1947.

He has served as president of New Mexico Cotton Ginners' Association and now is secretary-treasurer and a director. He also is a director and second vice-president of National Cotton Ginners' Association and a director of Pecos Valley Farm Planning Association.

Lovelace has been very active locally in aiding agricultural programs, boys' club work, experimental farms, livestock shows and similar activities in the agricultural and public relations fields.

A Catholic, he is a member and past Grand Knight of the Knights of Columbus.



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The Phelps Positive Action "Y" valve has a spring action so arranged that the valve is held by a spring tension in both positions . . . (material flowing straight through the valve or turning into the "Y"). All joints are electric welded and lapped to assure a smooth flow of material. The valve seats behind an offset to eliminate any possibility of restriction within the "Y".

The Phelps Positive Action "Y" valve can be furnished in all sizes with all types of connections, manual or power operated. Lever can be adapted for split-load operations. The spring action assures you a quick, positive change from one line to the other . . . and it will not leak into the alternate line. Construction of ⅛", or heavier, steel plate.

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Eliminates "Choke-up"!
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SCORE A BULL'S EYE IN '55

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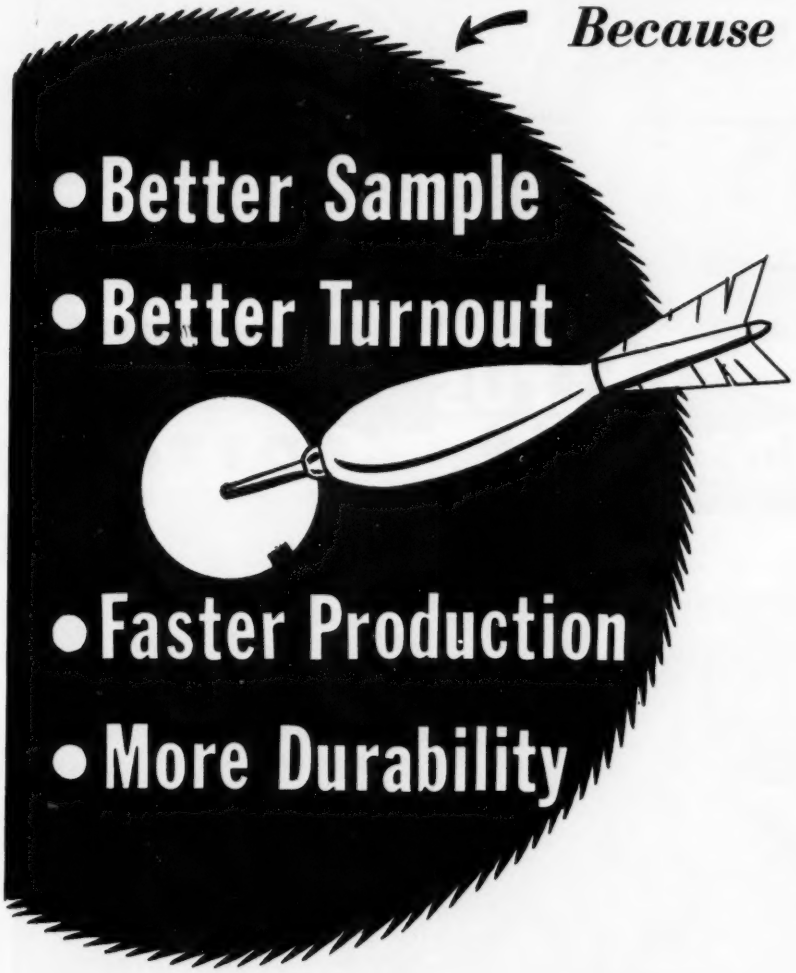
Because You Get



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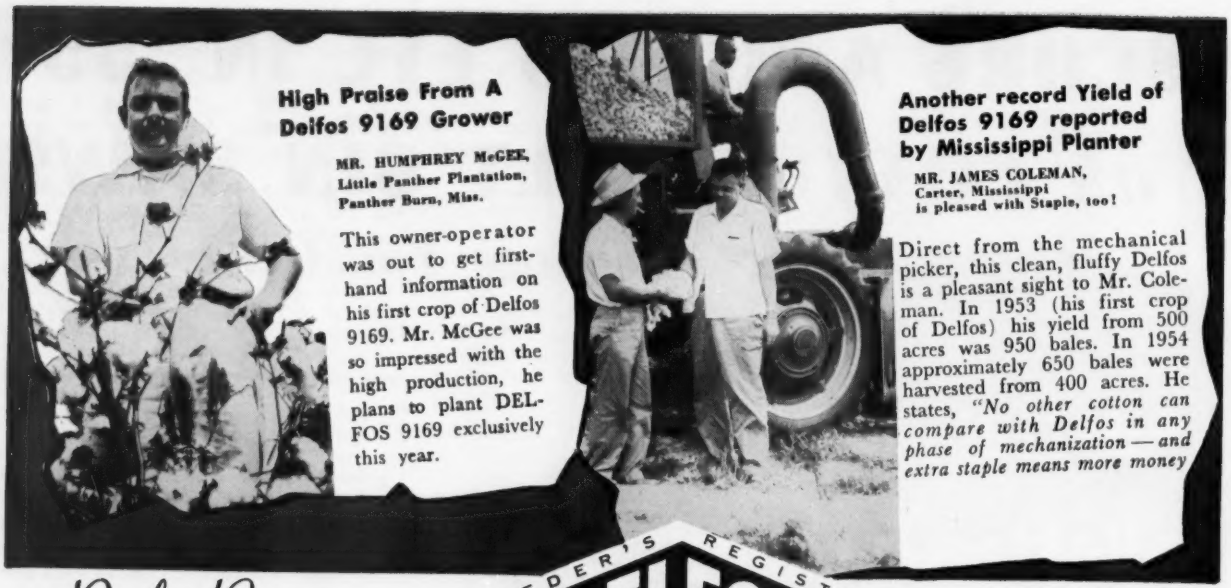


High Praise From A Delfos 9169 Grower

MR. HUMPHREY McGEE, Little Panther Plantation, Panther Burn, Miss.

This owner-operator was out to get first-hand information on his first crop of Delfos 9169. Mr. McGee was so impressed with the high production, he plans to plant DELFOS 9169 exclusively this year.

Another record Yield of Delfos 9169 reported by Mississippi Planter

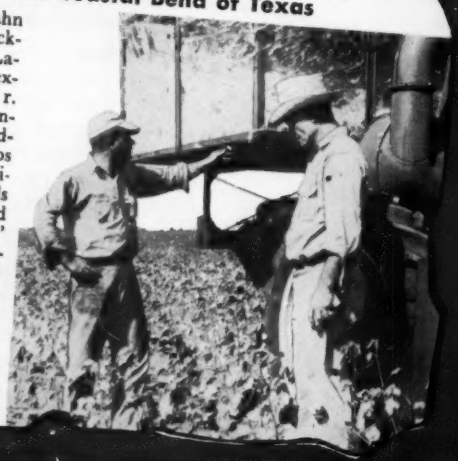
MR. JAMES COLEMAN, Carter, Mississippi is pleased with Staple, too!

Direct from the mechanical picker, this clean, fluffy Delfos is a pleasant sight to Mr. Coleman. In 1953 (his first crop of Delfos) his yield from 500 acres was 950 bales. In 1954 approximately 650 bales were harvested from 400 acres. He states, *"No other cotton can compare with Delfos in any phase of mechanization — and extra staple means more money*

Profit Reports From the Land in BREEDER'S REGISTERED DELFOS 9169 COTTON!

A good argument for Mechanical harvesting— From the Coastal Bend of Texas

Mr. W. H. Hahn (left) custom picker from Port Lavaca, Texas explains to Mr. Ralph Bales, owner of field, the advantages of Delfos 9169 for mechanical picking. "Bolls well off the ground . . . No waste . . ." Mr. Bales is convinced that 9169 is the best cotton he ever raised because of its high production and excellent staple, too!



Increased Acreage In DELFOS 9169 for Four Years —A Rio Grande Valley Story

D. L. Smith, Rio Hondo, Texas and our plant breeder, Dr. Manning, look over a crop that averaged 1½ bales per acre. With 20 acres the first year—150 acres in second year—400 acres the third—and 700 acres last year, Mr. Smith's entire 1,200-acre planting will be in Delfos 9169 This year. Heavy production and extra staple are some of the reasons. Mr. Smith says "It's easy to clean up and buyers go for the extra staple."

The KING

for '55

Experienced planters know the importance of picking a PROVEN Winner for '55! Increased production costs on decreased acreage demand maximum profit from the greatest possible yield. That's why the demand for Delfos 9169 is greater than ever before!

★ Extra heavy [illegible] extra bales [illegible]

★ Excellent Staple [illegible] profit from every [illegible]

★ Big, easy-to-pick [illegible] well off the ground [illegible] Mechanical pickers.

Truly, the "KING" of Cotton was developed in Stoneville [illegible] specific demands of [illegible] needs. Write for literature [illegible] interesting testimonials.

STONEVILLE SEED *Company, Inc.*

OFFICERS AND DIRECTORS of the National Cotton Council are shown here as they met at Houston.

At Meeting in Houston

Cotton's Opportunities Outlined by Council

■ **GAINS made through organized efforts since 1939 are measured against possibilities for future progress and industry asked to make decision. Wynn succeeds Durand as president.**

COUNTING cotton's opportunities, as measured against accomplishments since 1939, the Cotton Council mapped a future course and asked the industry to decide how far it wants cotton to go. That, briefly, was the major activity at the annual Council meeting Jan. 31-Feb. 1 in Houston, where a record attendance filled the Shamrock Hotel.

Pattern for the meeting was set a year ago when the Atlanta convention charged the Council's staff with the responsibility of making a detailed study of past work and future opportunities. President A. L. Durand's keynote address at the 1955 meeting, published elsewhere in this issue, outlines this.

• **Long-Range Plan**—This pattern was developed further at Houston when the following resolution on long-range proposals was adopted:

"That the report as presented to the delegates be accepted as basis for further detailed study of the industry's needs and opportunities;

"That the report be next referred to an industry-wide committee, representative of every section of the Belt and every segment of the industry, to be appointed by the board of directors and responsible to it; and

"That the committee be requested to make a thorough study of the proposals, and cost estimates on each, and to submit to the board a specific recommendation on whether or not the Council's program should be expanded; and, if so, the extent and nature of the expansion, and the ways and means by which the expansion should be financed; and

"That the board be directed to report to the 1956 convention the recommendations of the industry-wide committee and its appraisal of the recommendations for the consideration of the delegate body."

• **Wynn Named President**— Elected president was W. T. Wynn, producer, who was active in the organization of the Council in 1938 and has served since as treasurer. Last year he also headed the important operating policy committee.

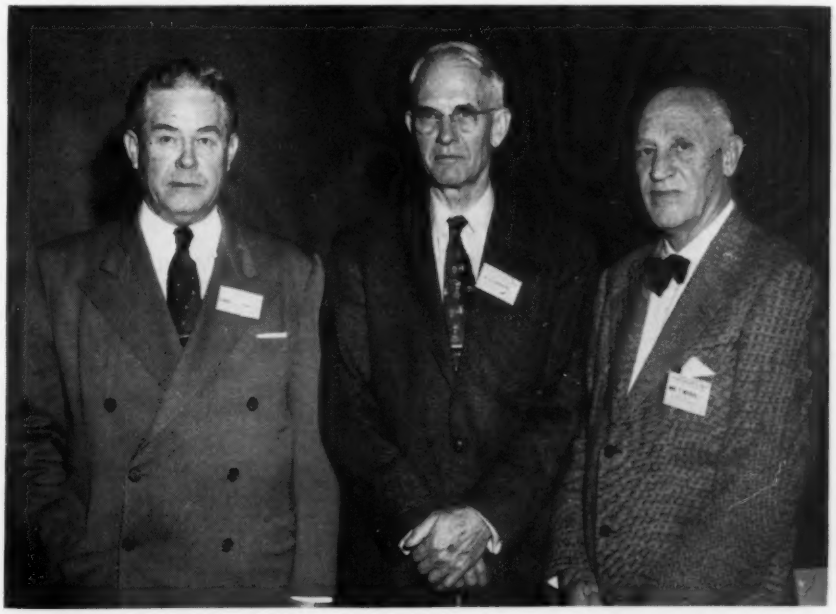
Wynn, who was born March 23, 1890, at Greenville, Miss., succeeds Durand, who is 1955 chairman of the board.

He is engaged in farming, warehousing, financing and textile phases of the cotton industry, and is a lawyer. His numerous activities have included serving in World War I, membership in the Mississippi legislature, presidency of the Delta Council, and other positions of leadership. He and Mrs. Wynn have one son, Douglas, now studying law at the University of Mississippi.

Officers, in addition to Wynn and Durand, include: Oscar Johnston, Greenville, Miss., founder and honorary chairman of the board; B. L. Anderson, Fort

(Continued on Page 60)

SHOWN HERE, left to right, are Aubrey L. Lockett, Vernon, Texas, 1955 treasurer of the Council; A. L. Durand, Hobart, Okla., chairman of the board who served as president last year; and W. T. Wynn, Greenville, Miss., the new president, who served as treasurer from 1939 through 1954.



To Start Work March 1

Ed Bush Named Vice-President Of Texas Ginners' Group

■ **STATE'S Extension cotton ginning specialist is selected to serve Association as its executive officer.**

THE APPOINTMENT of Ed H. Bush as executive vice-president of Texas Cotton Ginners' Association has been announced by Jerome W. Jalufka, Robstown, president of the Association.

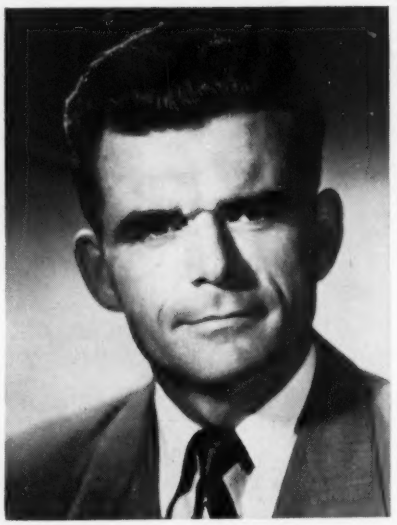
Effective March 1, the appointment was made following a meeting of the Association's executive committee at Corpus Christi on Feb. 5, at which a number of applicants for the position were interview and given careful consideration.

Bush succeeds Jay C. Stilley, executive vice-president of the Texas organization for the past nine years, whose resignation was announced in The Press Jan. 29.

Texas ginners' new executive vice-president is well known among ginners, members of allied industries and cotton farmers throughout the state, as a result of his work in every cotton-growing county. He has been Texas Extension cotton gin specialist since April 30, 1951, when he succeeded the late Fritz Lichte, with whom he worked as assistant for some time prior to Lichte's retirement.

In addition to working closely with ginners and gin machinery manufacturers, Bush has been active in cooperating with other Extension workers and farmers on cotton production problems related to ginning, such as improved harvesting methods to help assure better ginning.

Bush and Fred C. Elliott, Texas Extension cotton work specialist, are co-authors of an article, starting on page 72 of this issue of The Press, emphasizing the importance of proper harvesting and ginning.



ED H. BUSH, College Station, who will become executive vice-president of Texas Cotton Ginners' Association on March 1, has been gin specialist with Texas Extension Service.

• Texas Co-op Ginners Elect Jack Funk

JACK FUNK, Lyford, Texas, manager of the Lyford Gin Association, was named president of Texas Co-operative Ginners' Association at the annual meeting in San Antonio, Feb. 7-8 at the Plaza Hotel. Funk, who succeeds Wilmer Smith, also was elected president of the Lower Rio Grande Valley Ginners' Association recently, as reported in a story elsewhere in this issue.

Co-operative ginners met jointly with Texas Federation of Co-operatives and the Houston Bank for Co-operatives. This was the third year that the three groups have met together.

J. E. Cox, manager of Waxahachie Co-operative Gin, was named vice-president, and Truman L. McFarland, manager of Farmers' Co-operative Gin, Childress, became secretary.

Bruno E. Schroeder, Austin, is executive officer for the ginners and the Texas Federation of Co-operatives.

Four directors who were re-elected at San Antonio are Ernest Jones, Lamesa; R. A. Graham, Greenville; Glee Taylor, Lake Creek; and Harold A. Hansen, El Campo. A. R. Eaton, Rule, was elected to the board and Walter Martin, Littlefield, was elected to fill out the term of R. T. Frederiksen, who has moved to New Mexico.

Holdover directors are I. S. Pate, Voss; Truman L. McFarland, Childress; C. C. Atchison, Frisco; R. J. Henderson, Kerens; H. E. Gainer, Hutto; and Milton Hornung, Three Rivers.

The convention heard a number of guest speakers, and members discussed ginning and related problems at special commodity sessions. A banquet and dance and luncheon for ladies were among entertainment features.

1517 Association Names Officers, Directors

Members of the 1517 Cotton Association met in Las Cruces, N.M., Jan. 25 and re-elected officers and directors.

Re-elected were W. H. Gary, Rincon, N.M., president; W. R. Tennison, Elfrida, Ariz., director; David D. Davis, Pecos, Texas, director; and Fred M. Nelson, Roswell, N.M., director.

Holdover directors are W. C. Gaines, Deming, N.M., and Erich Brandes, El Paso.

Short Course for Sprayers

An aerial spray operators' short course will be held March 1-2 at the University of Missouri, Columbia. Sterling Kyd, Extension entomologist, says anyone interested in the application of insecticides and herbicides is invited.

• Winners Named in South Carolina

WITH an official yield of 5,900 pounds of lint cotton produced on five acres, J. C. Bouknight, Irmo, Richland County, is the state winner in the 1954 South Carolina Five-Acre Cotton Contest. Second place winner is Wm. G. Smith, Jr., Johnston, Edgefield County. His official yield was 5,535 pounds of lint. Winner of the State 4-H Club Agricultural Scholarship is John D. Bouknight of Irmo. His yield was 4,330 pounds.

First and second place winners in the three districts and their yields are: Upper district, Albert Robinson, Ninety Six, 4,630 pounds lint, and R. S. O'Dell, Liberty, 3,745 pounds lint; Middle district, Frank Berry, Johnston, 5,235 pounds lint, and Mrs. Louise P. Wise, Trenton, 4,850 pounds lint; and Lower district, James DuBois, Ruffin, 4,640 pounds lint, and Bob Fleming, Alcolu, 4,515 pounds lint.

Announcement of the winners in the state, district, and county contests was made at a luncheon at the Jefferson Hotel, Columbia, Jan. 28, at which time prizes totaling $5,725 were awarded.

The winner of the first state prize received a check for $750 and the second place winner a check for $275. The first and second place winners in the upper, middle, and lower districts of the state each received $200 and $125 respectively.

The 4-H Club scholarship is worth $500. The state and district prizes were made available by the South Carolina Textile Manufacturers' Association. The 4-H Club scholarship was donated by the Atlantic Cotton Association. The contest was conducted by the Clemson Extension Service.

First and second county prizes were awarded contest winners in 43 of the 46 counties of the state. In each of these counties 10 or more contestants completed demonstrations to make them eligible for county prizes. The county prizes were donated by the South Carolina Cotton Seed Crushers' Association. W. G. Taylor, Lancaster, is president of the crushers, and Mrs. Durrett L. Williams, Columbia, is secretary-treasurer.

There were 1,075 five-acre fields entered in the state contest and records were completed on 771 of these fields. This record is one of the highest since the contest started in 1926. The average yield for the completed demonstration was 476 pounds of lint per acre which is considered good in view of the very unfavorable weather conditions of the past season.

D. W. Watkins, director, Clemson Extension Service, presided at the luncheon and introduced former state prize winners and several guests. The county prizes were delivered by Augustus J. Sitton, Pendleton, representing the South Carolina Cotton Seed Crushers' Association; the state and district prizes by E. S. McKissick, Easley, representing the South Carolina Textile Manufacturers' Association; and the 4-H Club scholarship was delivered by D. E. McCuen, Jr., Greenville, representing the Atlantic Cotton Association.

■ **MR. AND MRS. W. R. FLIPPIN are receiving congratulations as grandparents of GWEN LE PRINCE GRAVES, daughter of DR. AND MRS. L. R. GRAVES, JR. Grandfather is with Buckeye at Memphis.**

as viewed from The "PRESS" Box

• In Appreciation: Our Authors . . .

AUTHORS of special articles and other information in this issue—the second Better Production Practices issue which The Cotton Gin and Oil Mill Press has published—are among the best informed men on their subjects in the country. Their cooperation has made it possible to give readers the latest authoritative facts on a wide range of subjects relating to cotton production, harvesting, ginning and the use of cottonseed feed products. Ginners and crushers, as well as farmers, should find this edition a valuable permanent reference—thanks to the men in many different states who have written material for it.

• . . . And the Council

VERY APPROPRIATE, it seems to us, is the coincidence that the annual meeting of the National Cotton Council is reported in this Better Production Practices issue. The Council, certainly, ranks very high among the groups that are doing the most to see to it that cotton production practices really are better. The record shows that much has been done to improve practices since the Council started working in 1939; and the plans for the future, which are discussed in the general meeting story and address by A. L. Durand in this issue, show that much more can be done in the future. Ginners and crushers have an interest at least equal to that of any other group in seeing that the cotton industry takes advantage of the opportunities that the Council is charting.

• Ginners' Directors

OKLAHOMA Cotton Ginners' Association has announced the election of the following directors during district meetings held in December. These directors will take office at the annual convention, Feb. 23-24, which is the subject of a story elsewhere in this issue: Sam LaFaver, Watonga; J. W. Dowlen, Temple; C. H. Nelms, Tipton; E. C. Bynum, Indianola; Ed Mitchell, Wynnewood; C. L. Matlock, Okema; George Terry, Reed; Virgil Jumper, Idabel; Othol Edgar, Sentinel; G. N. Irish, Muskogee; Ivy Brown, Clinton; and M. K. Lyle, Glencoe.

• Life Hires Snell

DAVID SNELL, staff writer for the New York World-Telegram and Sun and son of J. B. Snell, Minden, La., president of NCPA, has recently been named an assistant editor of Life magazine.

He attended Louisiana State University, held a part-time position as staff artist for the Baton Rouge State Times and Morning Advocate, served with the Atlanta Constitution as staff reporter for two years, served during World War II with the Central Intelligence Division in Korea, and after the war joined the New York bureau of United Press as rewrite man on its foreign news desk.

In 1947 Snell went with the Sun as reporter and has subsequently appeared on television and radio programs. He received the George Polk Award of Long Island University for a series of articles on air pollution and the annual merit award of the Greater New York Committte Against Communism for radio and newspaper exposures of Communism.

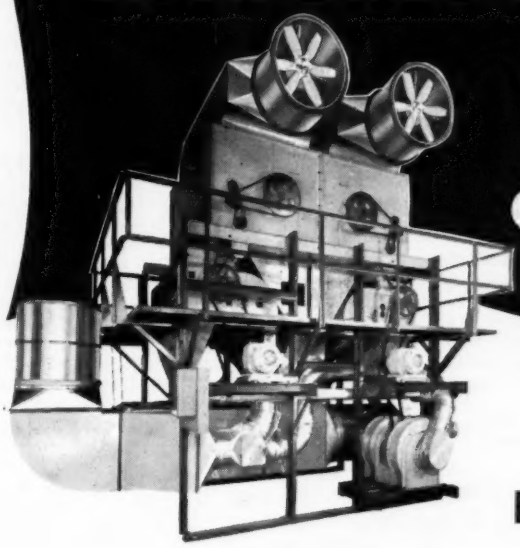
• Weed Meeting Elects

OFFICERS were elected at the eighth annual Southern Weed Conference, held recently at St. Petersburg, Fla., to serve at the 1956 meeting, Jan. 16-18, in New Orleans. Officials for the next meeting will be Dr. G. C. Klingman, North Carolina State College, president; Dr. W. B. Albert, South Carolina Experiment Station, vice-president; Dr. E. G. Rodgers, Florida Experiment Station, secretary; and H. E. Rea, J. R. Wheatley and W. K. Porter, executive committee.

• $2.4 Million Oil Sale

SALE of $2.4 million worth of cottonseed oil to Chile was announced Jan. 31 by USDA as part of the program of disposing of surplus commodities for currencies of foreign countries. Also sold in the transaction was about $2.2 million worth of wheat. USDA said about 8,000 to 9,000 tons of cottonseed oil were involved.

PUT MORE PROFIT IN EACH BALE WITH A MOSS LINT CLEANER



THE MOSS DELIVERS HIGHER GRADES

More Profits For You and Your Customers

Up-grading your customer's cotton and bringing him greater profit is the sure way to increase your own profit. Because of their outstanding performance, Moss Lint Cleaners bring new business to progressive ginners everywhere. Records show that they definitely improve the ginning a full grade or more!

Write for complete information!

MOSS-GORDIN LINT CLEANER CO.

3116 Main Street Dallas, Texas | 1132 S. Third Street Memphis, Tennessee | Third Street & Ave. O Lubbock, Texas

Present Status of Breeding For Disease Resistance

First wilt-resistant strain of cotton was developed in late 1800's. Here is summary of disease research from then through 1954.

By JOHN T. PRESLEY

JOHN T. PRESLEY is Pathologist, Field Crops Research Branch, ARS, USDA, Beltsville, Md.

BREEDING for disease resistance offers the most practical and economical means of controlling plant diseases. This approach has been used successfully in most of our crops. Cotton was one of the first crops in which a planned program of breeding for disease resistance was established. This work was started in 1895. Fusarium wilt had become so prevalent and destructive in the areas where Sea Island cotton was being grown that Mr. Rivers, a South Carolina cotton grower, began selecting the most resistant plants in severely diseased fields with the thought that the progeny from some of these plants would be more resistant to wilt than the average of the variety. He developed a highly resistant strain which was released as the Rivers variety.

It soon became apparent that Fusarium wilt was also a limiting factor in the production of upland cotton and attention was given to the development of a resistant upland type. From this work came the varieties Dillon and Dixie, both of which were resistant but did not possess the desired agronomic characters. Up to this time, all of the disease resistance work in cotton had been based on selection or the plant-to-row method of breeding. A crossing program was now initiated to transfer resistance from Dillon and Dixie to the commercially desirable, but susceptible varieties. The resistant varieties Dixie Triumph and Dixie Cook resulted from this work. From the foregoing, we can readily see that breeding for disease resistance in cotton is not a recent development.

Since these early disease investigations in cotton, numerous workers, both here and abroad, have made notable contributions to an understanding of the disease problems and to methods of control. Many of the commercial seedsmen have excellent research programs which include breeding for disease resistance. For the present purpose, however, the discussion will be confined primarily to the cooperative federal-state disease research program on cotton.

• **Current Work** — The current program of breeding for disease resistance involves Fusarium wilt, the Fusarium nematode complex, bacterial blight, Verticillium wilt and a new phase which is just being initiated on cold tolerance and disease resistance in seedlings.

Why are we still working on Fusarium resistance after all these years? The answer is simple. We are hoping to keep pace with the improvement program in order that Fusarium resistance will be included in the newer varieties, or at least will be available to the plant breeders who are developing the new varieties. At present there are several Fusarium-resistant varieties available which compare favorably in yield and fiber properties with susceptible varieties.

In early attempts to determine the mode of inheritance of Fusarium resistance, very erratic results were obtained because resistance would "break down" in certain areas or the results would vary from year to year. This apparent breakdown of resistance was found to be due to the presence of nematodes in the soil. When nematodes attack the roots of plants, the wilt fungus is able to enter and cause even resistant plants to wilt or to exhibit varying degrees of resist-

(Continued on Page 75)

Table 1.—Estimated reduction in 1954 cotton yield caused by diseases.

Diseases	Calif.	Ariz.	N. M.	Texas	Okla.	Mo.	Ark.	La.	Miss.	Ala.	Ga.	S. C.	N. C.	Tenn.	Bales lost	Percent loss
PARASITIC																
Fusarium Wilt *F. vasinfectum*	0	0	0	.1	0.1	1.0	2.6	3.5	3.0	1.0	2.8	2.2	.7	.5	191,510	1.21
Verticillium Wilt *V. albo-atrum*	4.5	2.1	4.1	.9	**	.5	**	.1	.5	0	0	0	.1	.2	160,196	1.01
Bacterial Blight *X. malvacearum*	**	.8	.3	1.2	0.3	.5	1.0	.5	.2	0.5	1.0	1.2	.1	0	112,341	.71
Root rot *P. omnivorum*	**	1.9	.1	2.2	0.2	0	0	**	0	0	0	0	0	0	114,410	.72
Anthracnose boll rot *G. gossypii*	0	0	0	.5	0	.5	**	1.0	.5	.5	.7	.1	0	0	49,153	.31
Seedling diseases *Rhizoctonia*, etc.	2.0	2.6	.6	1.9	.5	2.5	5.2	2.8	4.7	1.0	4.8	5.0	2.5	0.5	460,856	2.91
Ascochyta blight *A. gossypii*	0	0	0	.04	0	0	0	**	**	0	.6	0	0	0	6,090	.04
Boll rots *Rhizopus*, etc.	1.5	.7	.1	.4	.3	1.0	.4	1.5	1.0	1.5	1.0	.5	.2	0	114,360	.72
Root knot *Meloidogyne* sp.	2.0	2.3	.1	.1	.3	0	.65	.5	.5	3.0	2.7	6.2	1.7	0	175,479	1.11
Percent loss	10.0	10.4	5.3	7.34	1.7	6.0	9.85	9.9	10.4	7.5	13.6	15.2	5.3	1.2		8.75
Bales lost	163,842	101,029	17,647	317,020	5,102	30,337	221,523	64,787	184,252	58,784	98,880	94,176	20,298	6,721	1,384,398	
NON-PARASITIC																
Others including nutrient deficiencies	1.5	2.1	1.6	1.9	—	5.0	29.9	3.0	.7	0	2.5	4.1	.7	1.5		5.80
Bales lost	24,576	20,400	5,328	82,063	—	25,281	672,440	19,633	12,401	—	18,176	25,403	2,681	8,402	916,784	
Total percent loss	11.5	12.5	6.9	9.24	1.7	11.0	39.75	12.9	11.1	7.5	16.1	19.3	6.0	2.7		14.55
Total bales lost	188,418	121,429	22,975	399,083	5,102	55,618	893,963	84,420	196,653	58,784	117,056	119,579	22,979	15,123	2,301,182	
Yield bales 1954*	1,450,000	850,000	310,000	3,920,000	295,000	450,000	1,355,000	570,000	1,575,000	725,000	610,000	500,000	360,000	545,000	13,515,000	

* Dec. 1, 1954, Bureau of Agricultural Economics, USDA, estimate
** Trace

NEW DIXISTEEL BUCKLE WINS NATIONAL ACCLAIM!

Ginners, Compressors, Associations Enthusiastically Endorse New Buckle Now Shipped with Dixisteel Ties

For years the industry has searched for a cotton tie buckle that has the holding strength of the band itself. And now, after two years of research, development and exhaustive testing, Atlantic Steel Company is proud to announce such a buckle has been perfected and is being shipped with its 1955 ties.

Ginners, compressors, and shippers have tested this new buckle under the most severe conditions—and it has come through with flying colors.

On standard density cotton the new DIXISTEEL Buckle has proved 100% satisfactory. No slippage. No broken or bent buckles. Virtually no bands cut at the buckle.

On high density bales, the new buckle has proved superior to other buckles. One compress-warehouse reported no slippage on 85% of the bales and negligible slippage on 15%—less than ¼-inch! Another reported no slippage. And spiders were found on only two out of 700 bales when they reached port.

Managers, foremen, tiers, shippers all agree that the new DIXISTEEL Buckle is a tremendous improvement over the old arrow buckle.

Specify DIXISTEEL Cotton Ties and you will get the new DIXISTEEL Buckle.

Greatest Development Since 1881

- 60% stronger
- Transmits 87% of tie strength, compared with Arrow's 60%
- Good throat, easy threading
- Lies flat to band—makes palletizing easy; minimizes friction against other metals in boxcars—believed a cause of cotton fires
- Lips are equal width on both sides of the slot
- Breaking strength 300 to 1000 pounds greater than other buckles

DIXISTEEL COTTON TIES

Standard bundles weigh approximately 45 pounds and contain 30 ties—each 15/16 inches by approximately 19 gauge, 11½ feet long. Thirty buckles attached to each bundle. Sixty-pound ties also are made. Both weights available without buckles. Buckles shipped in kegs or carload bulk lots.

DIXISTEEL TRADE MARK COTTON TIES AND BUCKLES

made only by the

Atlantic Steel Company

ATLANTA, GEORGIA

from our Washington Bureau

by FRED BAILEY
WASHINGTON REPRESENTATIVE
The COTTON GIN and OIL MILL PRESS

• **Outlook Brighter** — Chances now appear to be brighter for an increase in this year's cotton allotment.

Lawmakers seeking an adjustment are lowering their sights, asking for a boost in the neighborhood of only one-half million acres, instead of one million and more. This revised and modest objective may win support for an increase from USDA which has been reluctant to go along on a substantial increase.

Protests from outside Washington against present allotments have been on the rise, also prompting renewed hope for final action by Congress. At least a dozen bills seeking a boost have now been introduced on Capitol Hill. Main aim is said to be "help to the small grower" who, through no fault of his own, may find his allotment cut sharply, or even eliminated.

"One of the pricipal aspects of these bills," said lawmakers, "provides that the small farmer gets either the smaller of five acres or the highest planted acreage in the three previous years."

Southern lawmakers have been conferring with USDA officials to get an idea of the minimum additional acres that would be required to take care of hardship cases. Present estimate: 400,000 to 600,000 acres.

• **New War Jitters** — Renewed war jitters in Washington have the experts once more trying to figure out where agriculture would stand after an outbreak of hostilities. Following outbreak of the Korean fighting, it is pointed out, prices went up higher and faster for cotton and cottonseed than for almost any other commodities. Prices of both siderably outran the general inflationary trend .

Would this happen again?

Probably not, Washington thinks. In 1950, cotton and cottonseed supplies were short. World supplies of cotton are not now large, and prices probably would move up some. However, since 1950 there has been a sharp build-up in synthetics that probably would tend to keep cotton lower this time.

• **Controls Likely** — Another likely result of a big war would be price, wage, and credit controls. Timing of their application, however, would be uncertain. Many economists here think credit controls alone would suffice to keep the economy in balance for awhile. Meantime, President Eisenhower has made it clear that he will not ask Congress to vote standby control powers at this time. However, he does make it clear that he won't object if Congress voluntarily provides him the authority.

Such power for the executive, he says, would have advantages, such as giving him the clear-cut right to move fast in the early days of an emergency. The big disadvantage: Standby powers, granted now, might cause unjustified price and wage increases in advance of an emergency.

• **No Package Program** — Washington farm leaders are already assuming that Benson & Co. will decide to toss out the "package" price support program for cottonseed this year. Trend of USDA thinking is undeniably in that direction, with the odds good that there won't be a change in official feeling.

How Congress feels, is another matter. Many lawmakers probably would go on record against elimination of cottonseed supports. How seriously they will fight is another question. Some observers here think Congress would put up only token resistance to the change on on the theory that present support doesn't help the grower much, if any, anyhow.

• **Dairymen Licked** — Dairymen have taken a licking in the first stages of their fight to tag certain margarine advertising as misleading. Two Federal Trade Commission examiners have recommended dismissal of complaints against Reddi-Spred Corp., Philadelphia, and Blanton Co., St. Louis.

Charges against the companies are to the effect that they are misleading consumers by using advertisements containing the words "butter" and "cream." Decision of the government examiners was: (1) That the law does not deny the right to set out one ingredient from others, nor to state truthfully that a product contains what it does, and (2) that the advertising clearly included the word "oleomargarine."

The case is not yet finally settled. A hearing examiner's intitial decision may be stayed, reviewed by the full commission, or appealed. An appeal from the rulings has been made by the National Milk Producers Federation, and will be heard by the FTC.

"As test cases," the milk federation says, "the final decision may well set the pattern for olemargarine advertising in the future. In enacting the oleo law, Congress intended to go beyond ordinary misrepresentation and strike specifically at that unfair type of advertising under which one product by suggestion or association of ideas attempts to capture the good will of another."

• **Fighting Started** — Watch for a noisy, head-on clash between USDA's top officials and farm-area lawmakers over the farm income and price issue. The infighting already has started on Capitol Hill.

Questioned in the Senate on the 25 percent drop in farm income from 1947 to 1954, Benson replied that "income per farmer has gone down less than total farm income," because farm population has also dropped 20 percent in the same period.

"If we take account of the income that farm people receive from non-farm sources," the Secretary said, "the realized per-capita income of farm people from all sources actually increased 6 percent from 1947 to 1954."

Many lawmakers remain unconvinced by the Secretary's arguments. They recall that farm income last year went down about 4 percent. As the debate went on, economists in Benson's department were getting together final figures on the farmer's price position in 1954. Highlights are these as reported in USDA's recent "Marketing and Transportation Situation":

Farm prices for food products averaged 5 percent lower in 1954 than in '53. Retail cost of foods declined, the report says, "only 2 percent." Marketing charges went up one percent. Whether net profits of middlemen increased was not calculated due to insufficient figures.

Most of last year's decline in prices came in dairy products, poultry and eggs. Prices were up somewhat for corn, wheat, cotton, soybeans, hogs.

■ **W. O. FORTENBERRY, Lubbock, has been re-elected district director of High Plains Underground Water Conservation District.**

Louisiana Delegates Visit at Houston

THREE DELEGATES from Louisiana are shown as they visited during the recent annual meeting of the National Cotton Council in Houston. Left to right are Maxwell Yerger, crusher from Tallulah; George T. Hider, ginner from Lake Providence; and John T. Carroll, also a ginner, from Gilbert.

• Chemical Meeting Held in Lubbock

THE SECOND annual Agricultural Chemical Conference was held at Texas Technological College, Lubbock, Feb. 2-3.

Included on the program were E. N. Jones, Texas Tech president; W. L. Stangel, dean of the division of agriculture there; John Key, Lubbock National Bank.

Russell Coleman, National Fertilizer Association, Washington; J. F. Fudge, Texas Experiment Station; W. E. Irvin, Phillips Chemical Co., Bartlesville, Okla.; Arthur M. Smith, Olin Mathieson Chemical Corp., Baltimore, Md.; N. D. Morgan, American Potash Institute, Shreveport, La.

Jack Creel, Radio Station KFYO farm editor; R. M. Fielder, West Texas Utility Co., Abilene, Texas; Art Brawley, American National Bank, Amarillo, Texas; F. C. Bishopp, Pink Bollworm Research Center coordinator, Brownsville, Texas; H. L. Haller, Agricultural Marketing Service, USDA, Washington; E. E. Ivy, Agricultural Research Service, USDA, College Station, Texas; August Balzer, OK-Texas Chemical Co., Lubbock.

Donald Ashdown, Texas Tech; J. A. Wright, First State Bank, Abilene; H. E. Rea, Texas Experiment Station, College Station; Allen F. Wiese, Texas Experiment Station, Amarillo; E. H. McIlvain, Southern Great Plains Field Station, Woodward, Okla.; Don L. Jones, Texas Experiment Station, Lubbock; Fred C. Elliott, Texas Extension Service, College Station; Cecil Meadors, Jr., Texas Experiment Station, Spur; C. E. Fisher, Texas Experiment Station, Spur; and M. W. Parker, Weed Investigations, USDA, Beltsville, Maryland.

Photo Courtesy Missouri Extension Service

Water Makes Cotton Grow

DR. W. C. ETHERIDGE, Chairman of the Field Crops Department, University of Missouri, is shown here with representative samples of irrigated and non-irrigated cotton taken from irrigation experiments at Campbell. Larger plants, of course, were those that were irrigated.

Help the King

King Cotton's throne in Georgia might get shaky in future years if farmers there keep underplanting cotton allotments by 163,000 acres—like they did in 1954—says E. C. Westbrook, Extension cotton specialist.

Failure of farmers to plant 1954 cotton acreage was termed "a definite financial loss to the state, and one they cannot afford to repeat in 1955."

Westbrook urged farmers who do not plan to grow cotton in 1955 to release their allotted acres so that other farmers may use them. He points out that the farmer releasing the acreage gets credit for planting the cotton.

New Tobacco Shade Cloth Of Cotton Is Durable

An improved, protectively-treated cotton tobacco shade cloth has saved some Florida tobacco growers an estimated $200 per acre each season they have used it over their fields, says USDA.

A simple, economical treatment was developed by scientists of USDA's Southern Utilization Research Branch, New Orleans, a part of the Agricultural Research Service.

At least two textile-finishing companies are producing the treated cloth for sale. When the current tobacco-growing season opens, about five million square yards will be going into a second or a third year's use, and an additional 750,000 yards will be put out for the first time.

Growers who used 50,000 square yards to cover 10 acres in 1951, 1952, and 1953 report that treated cloth is usable three seasons as top cover, without replacements, and then it retains about a quarter of its strength. In contrast, untreated cloth usually falls to pieces after only one season out of doors.

A Fisherman's Prayer

God, grant that I may live to fish
Until my dying day.
And when it comes to my last cast,
I then most humbly pray:
When in the Lord's safe landing net
I'm peacefully asleep,
That in His mercy I be judged
Good enough to keep.

Beef Week Promotion Helps Texas Sales

Evidence that retail beef sales were stimulated by "Beef Week in Texas," the Texas Beef Council's first promotional effort last November, was released in February by Roy Parks of Midland, Council president.

A spot survey made during December and January of meat retailers in major markets indicated the November event produced a satisfactory response, Parks said, considering the shortness of time the cattle industry had to prepare for Beef Week.

Inquiries were sent to 500 retail stores through the Texas Retail Grocers' Association, Parks said, with replies being received from 87. Those responding reported sales increases during the week of from 2 percent to 15 percent, with the average increase 8 percent.

"The survey also points up our weaknesses, which we will take steps to correct," Parks said. "For example, not many retailers report having received any help from their local TBC chairman. This was because our program was just a month old then, and we had just begun to organize. By next fall, we'll have an active committee in every county in Texas."

Parks said also that retailers evidently did not use the tie-in ad mats very widely, and attributed this also to shortness of preparation time.

• Citrus Vitamin May Help Cure Colds

VITAMIN P from citrus fruit peel and pulp has given promising results in relieving colds, according to a report in the American Journal of Digestive Diseases.

Two doctors controlled colds, flu and tonsil infections in 61 patients within 8 to 48 hours after giving them tablets containing vitamin P and vitamin C. Other patients did not show any benefits but the physicians are encouraged by the results.

The physicians said vitamin P seems to strengthen the walls of tiny blood vessels or capillaries, which are weakened by infection. The weakening permits easier spread of viruses or germs into body tissues. Restoring the capillaries to normal strength would limit the spread and keep the germs more confined for better attacks by protective white blood cells or antibodies.

■ **LAYNE BEATY is now chief of radio and television service for USDA, Washington. Before serving abroad for several years, he was farm director for Station WBAP, Fort Worth.**

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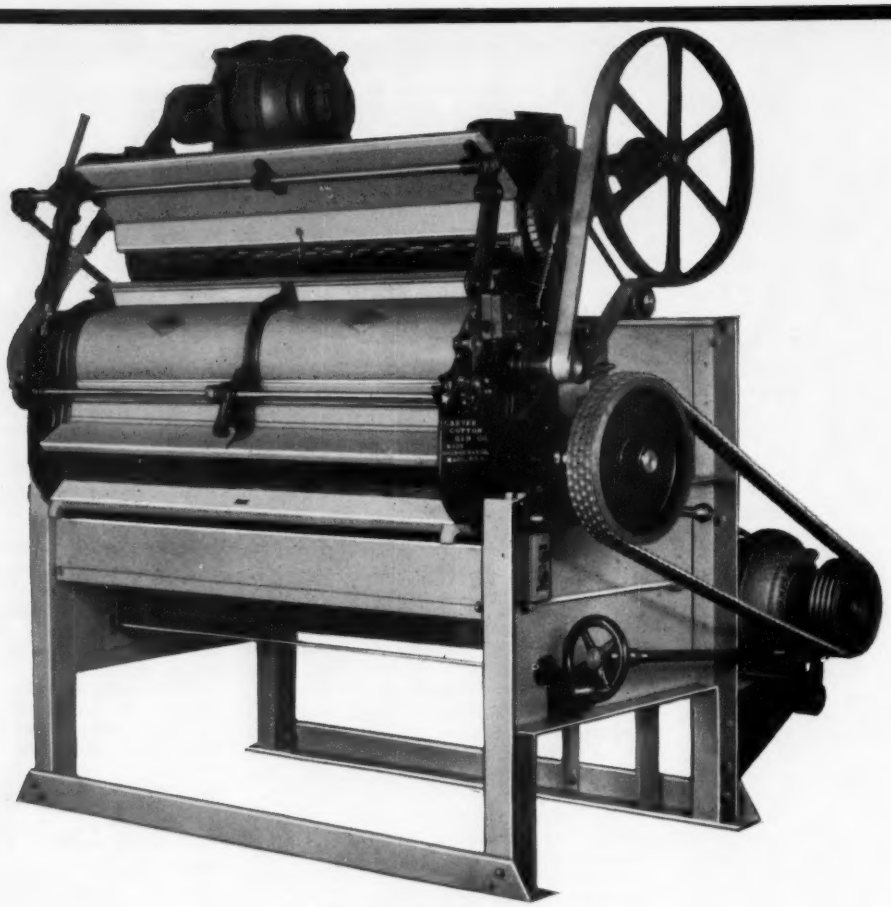

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REPAIR PARTS STOCKS AT ALL POINTS
FOR YOUR CONVENIENCE

What Irrigation Does For Capps Family

How do you grow cotton come rain or shine? Capps Brothers credit supplemental irrigation for consistently high yields, despite drouth.

By BILL FOREMAN
National Cotton Council, Memphis

"YOU'LL KILL that cotton," neighbors warned Emmett Capps when he flooded the middles of his crop back in 1944. They had seen cotton "scalded" and the land crack open after periods of hot weather followed prolonged rainy spells.

"Dad blame it," Emmett reasoned, "I'm willing to take a chance. I'm tired of being buffaloed by the water situation."

Emmett turned the water in on the cotton and he's been doing it ever since. What's more, it's hard to find a cotton farmer in the neighborhood of England, Ark., who is not doing the same thing. They are the pacesetters in supplemental irrigation, a practice that is catching on everywhere cotton is being grown in the state.

Back in 1918, Arthur Capps, Emmett's father, migrated from the hills of Arkansas to Humnoke in the lower end of Lonoke County and in the heart of the rich prairie section.

The lowlands, he figured, provided some mighty fine pasture land—ideal for dairying. But the rains came. The place was flooded out the very first year. That did it for Arthur. With his wife and three young sons—Joe, Paul, and Emmett—he moved to Oklahoma and out of the mud.

Over in Oklahoma they saw what can happen where there isn't enough water—parched earth, crop failures, dust storms—forerunners of the great Dust Bowl of 1934. Depression caught the Capps in 1929. They sold the dairy in Oklahoma and moved back to the home place near Humnoke. Several years later, in 1935, the family settled down on a 130-acre place near England, about 15 miles to the west.

During this time the boys grew up, married and began families of their own. Their love of the land, willingness to work hard, and sound training they had received from their dad stood them in good stead. They became prosperous farmers.

In 1942 Emmett bought a 320-acre place two miles from England, about a mile east of Highway 30. The first year he averaged about a half bale of cotton to the acre. This was fairly good for the area but not nearly enough to suit Emmett.

"Why should a cotton crop burn up," he asked himself, "when prosperity is 20 feet under the ground?"

He had seen too many years when rains flooded the fields in the spring and the crops wilted during the drouths of the late summer. He couldn't do much about the rains but he could tap the underground water to slake the thirst of his crops during the growing season.

In August 1944, he drilled a 100-foot well near his home. Another well—the same depth—was put down in April 1948. The eight-inch turbine pumps discharge into a three-quarter mile dragline canal. The pump at the house discharges 1,500 GPM, the second pump, 900 GPM. Water from these wells has been used every year to irrigate part of the farm once or more.

"How about leveling the land in preparation for irrigation?" we asked Emmett.

"The Maker took care of that. We have a natural slope. All we did was turn the water in the rows," was his answer.

With the irrigation the silt loam cotton land that once produced a half to two-thirds of a bale to the acre now is yielding a bale and a half to the acre.

Emmett has moved to town and his sons now are renting the place. Two more enthusiastic farmers would be hard to find. Each began operating on his own as soon as he was graduated

In top photograph EMMETT and CHARLES CAPPS start an irrigation pump. Cotton field in center produced 1¼ bales per acre, was irrigated four times. Aerial view, snapped from Charles Capps' airplane, shows part of farm. Note equipment in yard at left.

from England High School. Rex, 23, is married and has two children. Charles, 20, is married and has a year-old daughter. Their homes are located next to each other on a corner of the farm.

A machinery shed nearby houses three mechanical cotton pickers—one two-row and a couple of one-row machines. Including tractors for the pickers, eight are owned by the Capps boys. They harvest their soybeans with a self - propelled combine. With the exception of chopping, their cotton operation is completely mechanized. Four-row equipment is used in land preparation and cultivation. Insecticides and defoliants are applied with airplanes.

While the Capps boys are wrapped up in farming, they have a zest for other activities. Charles, the gadgeteer, is proud of his all-metal, two-place Luscombe airplane, parked on a strip he leveled about a mile from the house. He's an amateur movie photographer and also likes to experiment with his sound recording equipment. Rex is a motorboating enthusiast and has an all-metal craft for his recreation hours at a nearby lake.

In 1954 the cotton allotment allowed Rex and Charles 169 acres of the 320 they rent from their dad. They had 146 acres in soybeans and three acres in corn, leaving a two-acre pasture and farmstead. Rex rents 135 acres adjoining the Capps property. This year the brothers are planning to rent an additional 440 acres.

"We started off by center furrowing the ground with the middle buster points in the old middles," Rex explained in describing the 1954 operation.

"Then we put our fertilizer down there and bedded back on it with disks. We followed through with the regular cultivation until time to irrigate, then we tried to get a high bed—one as high as possible so the water would flow through to the lower end."

The soil was analyzed as a guide to fertilization. From 500 to 550 pounds of 6-8-12 commercial fertilizer was applied on most of the acreage. Vetch was sown last year and again this year as a winter cover crop. All of the cotton ground was subsoiled in the winter of 1953. In some spots on the place soil fumigation was necessary as a root-knot preventive. Stoneville 2-B was the cotton variety planted.

Two choppings were necessary for thinning and weed control. The Capps estimate their costs for hand labor for this job amounted to about $3.50 per acre. The crop was poisoned three times. There were two aerial applications of 3-10-0 and one of 3-10-40. Bollworms were the worst pest.

Last year was a particularly dry year in the England area. Throughout the growing season, according to Charles, the crop didn't get as much as an inch in any single rain. Both soybeans and cotton needed water badly.

"Our cotton suffered," Charles explained, "because we were watering soybeans and couldn't get the water to the cotton always at the right time. Maybe we should have let the soybeans go. We irrigated them five times and watered the cotton four times. We applied about seven or eight inches to the cotton altogether and estimate it cost us about $2 per acre per irrigation."

Defoliants were applied with aerial equipment and the cotton was picked mechanically. Nearly all the crop graded middling with some going strict middling. Staple ran about 1-1/16 inches.

"Since we were unable to get the water to the cotton at just the right time our yields last year were a little below normal. We averaged about a bale and a quarter," the Capps boys said.

The few non-irrigated cotton farms in the area are averaging about two-thirds of a bale to the acre. With sufficient rainfall, however, these farms would average a bale to the acre, Charles estimates.

The Capps place was one of the most interesting stops on a tour which highlighted the Beltwide Cotton Mechanization Conference in Little Rock last July, and a statement in a leaflet distributed at the farm during the visit summarizes the family's evaluation of irrigation.

"We do not always make the highest yield per acre possible," it points out, "but have made consistently good yields of both cotton and soybeans. By having water available, drouths are not the disaster to us that they have been to some people. With our four-row equipment and mechanical pickers, we expect to continue raising cotton and soybeans."

What do you think?

Helicopter Defoliation Of Cotton Successful

Defoliating cotton by helicopter spraying gave good results this season in a demonstration in Rockwall County, Texas, says County Agent F. V. Irvin. He commented that the helicopter is excellent equipment for this type of farm operation, because it can follow the contours and do a good job at the end of the rows.

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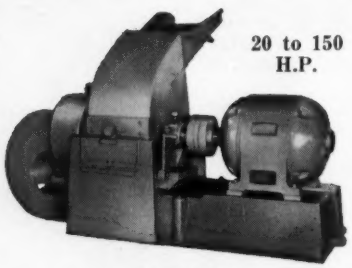

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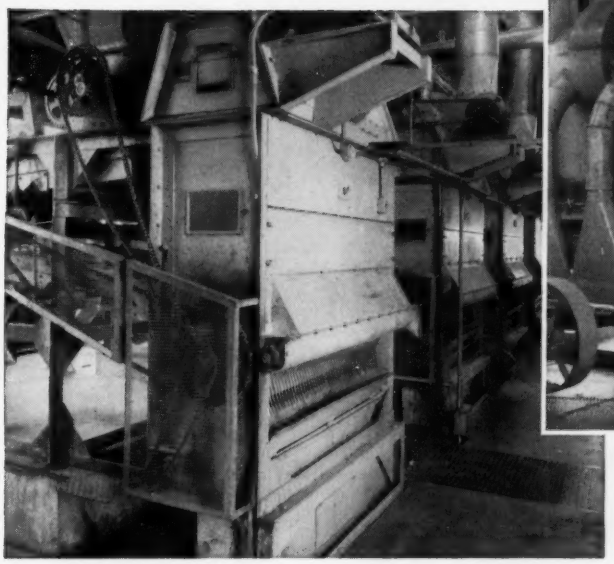

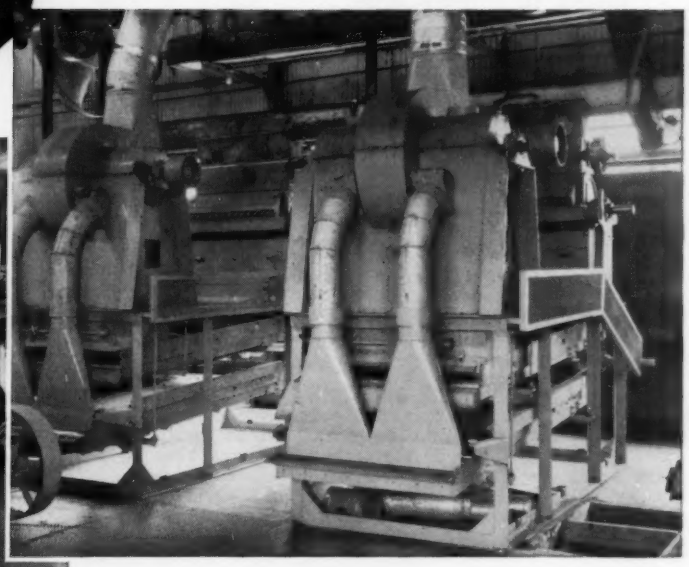

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- Bauer Separator-Purifiers for obtaining clean meats (shown in photo at right).
- Bauer Hull Beaters and Tailings Beater for removing fine adherent meats.
- Bauer Shakers
- Bauer-Memphis Defibrator for salvaging lint of high alpha cellulose quality.
- Bauer Stoners and Specific Gravity Separators
- Bauer Meal Grinders, Attrition and Hammer Mills
- Bauer Permanent Magnetic Separators

Various combinations of Bauer equipment are engineered to meet specific requirements.

Our Bulletin No. O-4 illustrates and describes the complete line. Each item is covered more thoroughly in an individual bulletin.

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Kenneth Wylie, Box 1164, Eugene, Ore.

Here are late developments in research on use of pre-emergence chemicals, rotary hoes and lateral oiling to reduce labor.

Controlling Weeds In Cotton Fields

By H. E. REA

The author, pictured at right, is Associate Professor, Department of Agronomy, Texas A. & M. College.

MOST OF US in Texas plant our cotton expecting it to come up clean. We hope to have little to do other than thin the cotton the first time over with the hoes. Some of us hill-plant our cotton to eliminate or greatly reduce the cost of thinning. Others make good use of mechanical choppers. Planting to a stand is advocated and is very effective if skillfully done.

Annual Weeds and Grasses

Our chances of having a low weeding cost are greatest when the weeds and grasses in our cotton fields are limited to annuals. The use of pre-emergence chemicals at planting time, rotary hoeing and lateral oiling of young cotton are practices that are highly effective in controlling shallow germinating weeds and grass seedlings.

• **Pre-Emergence Chemicals**—Pre-emergence chemical treatment of the soil over the seed as cotton is planted or shortly thereafter greatly increases the chances that the crop will come up free of annual weeds and grasses. This practice is applicable only where cotton is planted on a bed. The objective in using a pre-emergence herbicide is to create and maintain for a few weeks a concentration of the chemical that will kill weed and grass seedlings as they germinate in the upper one-fourth inch of the soil.

Rain after application of a pre-emergence herbicide is necessary to activate the chemical. Excessive rain may wash enough of the chemical down around the cottonseed to injure them. This is less likely to occur in a clay than in a sandy soil. Some pre-emergence herbicides cause severe injury to cotton stands—most frequently when the soil is cold and wet. Others damage the stand when temperatures are abnormally high. Slightly excessive rates of application of a pre-emergence chemical may cause some crop injury under most weather conditions.

Satisfactory control of shallow germinating weed and grass seedlings without injury to cotton can be expected under many conditions from the application of from four to six quarts of Premerge or three to four quarts of CIPC in 16 gallons of water to a 16-inch band over the planted row in clay loam and clay soils or six to eight ounces of Karmex W in heavy clay soils. Also promising results have been obtained with some rates of Alanap 5 under irrigated conditions in the drier areas.

The seriousness and frequency of weed infestations, crop risks, the skill of the farmer and the cost of herbicides are some of the factors affecting the wisdom of trying a pre-emergence chemical treatment. Only very limited acreage should be treated until after the individual farmer learns the results to expect from a particular pre-emergence herbicide in his own fields. Trials with Karmex W should be limited to heavy clay soils and this herbicide should not be used year after year in the same field until more is learned about its accumulated effects in the soil.

The cost of the herbicides per acre of cotton treated vary from $4.75 to $7 for the rates of Premerge and CIPC suggested for the treatment of a 16-inch band. Similar costs for Karmex W are $1.40 to $1.80. Disturbance of the chemical after it is applied usually terminates its effectiveness in controlling weeds. This may include cracking of the soil upon drying after a packing rain.

• **The Rotary Hoe**—Timely rotary hoeing is a very efficient method of materially reducing the stand of very small weed and grass seedlings in young cotton in soils that crust. Rotary hoeing alone and as a supplement to chemical and other cultural weed control practices is highly effective. Rotary hoeing after the major benefits of a pre-emergence chemical treatment have been obtained is an excellent method of preparing the cotton for subsequent post-emergence chemical treatment. It is also a highly satisfactory method of preparing young cotton for post-emergence chemical treatment where pre-emergence chemical treatment has not been used.

Rotary hoeing kills small weed and grass seedlings by kicking them up in numerous small clods of soil crust to which they are attached. Proper timing, precise control of depth and the use of a suitable speed are critical in successfully controlling weeds with a rotary hoe.

Rotary hoes suitable for use under a variety of conditions are available. The development and use of a new rotary hoe are reported in Texas Station Progress Report 1691. This new machine can be used sooner after rain and at a higher speed than any other cultural implement. The operating speed of most other types of rotary hoes is five to six miles per hour. During a critical period from May 5 to May 11, 1954, at College Station the new rotary hoe was operated at speeds of 15 to 18 miles per hour for 25 working hours before the soil was dry enough to start any other cultural operation. Six to eight acres of young cotton per hour were rotary hoed with this new machine just as fast as fields dried enough to support a Ford tractor.

The results obtained with the use of the new rotary hoe alone and to supplement pre-emergence chemical treatments in controlling thick stands of annual weed and grass seedlings without injury to cotton one and five weeks old were as follows: 65 to 70 percent control following one rotary hoeing; 85 to 90 percent control following two or more rotary hoeings; 95 to 98 percent control following rotary hoeing preceded by pre-emergence chemical treatment.

Rotary hoeing left the cotton row in very satisfactory condition for controlling subsequent crops of annual weed and grass seedlings by the lateral applications of post-emergence herbicides.

• **Post-Emergence Treatment** — While post-emergence treatment was not needed in 1954, it is known that lateral applications of five gallons of Varsol 1 per acre to a 10-inch band in the cotton row is an effective practice. Application of such oils at this rate to the stems of young cotton 3½ to 10 inches tall ordinarily does not injure the crop but kills 95 percent or more of the annual weed and grass seedlings less than 1½ inches tall. Young cotton stems are not susceptible to this rate of application of suitable herbicidal oils until after the stem bark begins to crack. Cotton is usually 10 inches tall by the time this occurs.

Lateral oiling of young cotton for the control of small weed and grass seedlings in the row is an effective, safe and efficient practice. Any Texas cotton farmer who plants on a bed and who is dissatisfied with cultural methods for controlling these seedlings during this period in the growth of cotton can suc-

cessfully use lateral oiling provided (1) he will quit "dirting" his young cotton, (2) acquire suitable oiling equipment and (3) take the time needed to learn how to oil properly.

Neither the use of pre-emergence chemical treatment nor lateral oiling is suited for use where cotton is planted in a furrow.

Johnson Grass

Weeding costs are very high in Johnson-grass-infested cotton fields in the state. Chemical methods are unnecessarily expensive for controlling thick stands of established Johnson grass in extensive acreages. Stands of such infestations can be reduced most economically by the use of suitable combinations of grazing, cropping and tillage practices. The chemical control of Johnson grass along field boundaries and spot-infestations in fields, however, is quite practical. Only the control of spot-infestations in cotton fields is discussed here.

Application of one-third teaspoonful of an herbicidal oil such as Varsol 1 to the crowns of an individual stem of tender second growth Johnson grass will kill it to the ground. Repetition of this treatment at intervals of seven to 10 days, as needed to prevent regrowth in excess of six inches, ordinarily eradicated rootstocks of this grass in a single season at College Station during the past three years. The most efficient use of the oil is obtained when application is to the lower one-fourth inch of the stem. This also permits the grass to be treated without killing adjacent cotton plants. Six or more consecutive oil treatments are usually needed to eradicate the grass. Mimeographed instructions on the method to use in spot-treating second growth Johnson grass are available from most county agricultural agents in Texas.

Spot-oiling of second growth Johnson grass was used to control scattered infestations in 1,500 acres of cotton on the Bluebonnet Farm at McGregor and in 491 acres on the A. & M. Plantation at College Station during 1954. A half and half mixture of Magnolia naphtha and diesel fuel oil was used on the plantation. The average cost of the oil and the labor for applying it was $2.35 per acre per application. Six crown treatments of the grass in a heavily infested field cost $14.10 per acre and eradicated 97 percent of the treated spots.

HCA (hexachloroacetone) at one-fourth pint and M-233 Dalapon at one-fifth pint per gallon, respectively, greatly increased the effectiveness of the oil used in crown treating Johnson grass at College Station in 1954. The maximum effectiveness of HCA was dependent on the occurrence of rain within a few weeks after its use, but the effectiveness of M-233 Dalapon was not influenced by rain. The use of these herbicides in the oil promises to greatly reduce the number of rootstocks surviving two or three crown oilings. However, infested fields will have to be patrolled regularly through the season to treat the few surviving clumps of Johnson grass.

Considerable progress was also made in 1954 in developing tractor equipment suitable for use in spot-spraying Johnson grass in cotton fields. Operators of hand spraybooms were tractor-transported at McGregor in spot-oiling Johnson grass. Sodium Dalapon was used to treat the foliage of short second growth Johnson grass in spots occupying two feet or more of the cotton row at College Station with a special tractor spot-sprayer operated at three miles per hour. Two tractor spot-treatments of the grass with sodium Dalapon at 15 pounds and Fab at 750 grams in 75 gallons of water per acre followed by one hand treatment of the surviving grass with one-fifth pound of sodium Dalapon and 10 grams of Fab per gallon of water eradicated 85 percent of the treated spots and reduced the stand of the grass 95 percent. The use of such tractor equipment requires the sacrifice of the cotton plants in the treated spots. The cotton can be saved by hand treatment of the grass, but tractor spot-spraying is more economical for treating fields predominately infested with large spots of Johnson grass.

Experimental Castor Bean Strippers Do Good Job

Improved harvesting equipment and a high-yielding variety of castor beans have brightened the castor bean picture in Arizona and elsewhere, making the crop a better alternative for acres taken out of cotton, says the Arizona Farmer-Ranchman.

Several successful strippers have been devised to replace combines for castor beans. These machines are both faster and cheaper than combines.

The improved variey is U.S. 367 developed by Dr. D. L. Van Horn. It should yield about 3,000 pounds per acre in Arizona—about 500 pounds over the standard Hybrid 4.

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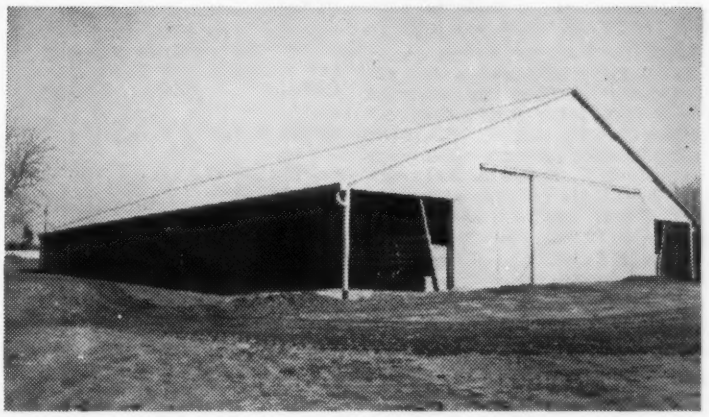

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Mississippi Irrigation Tests Are Reported

■ F. L. GERDES, Bobshaw Seed Co. manager, summarizes results of cotton irrigation tests during 1954 at site near Stoneville.

THE IRRIGATION of cotton in the Mississippi Valley, in general, proved quite profitable the past couple of years. This has been especially true where water was applied properly, as needed, to keep the plant succulent and fruiting and on land with a preparation emphasizing a deep tillage through the use of subsoiler, pan plow, etc. Experience shows that proper land preparation practices, together with an abundance of humus, are the first essential factors. Then, provision must be made to have an ample supply of water available to finish the crop.

Where the land has poor water absorption and holding capacity, and when the water supply has been exhausted before making a full crop or has been limited, the results have been more or less disappointing. This, coupled with failure ahead of planting to plan efficient methods of applying water uniformly, emphasizes the need to proceed with caution in going for all-out irrigation.[1] Experience on each farm should be be gained gradually by making provision for irrigation on a limited basis the first year or so.

That irrigation pays when proper practices are followed has been proven in experiment station tests, in five-acre contests, and in farm operations carefully planned and conducted. In 1952, Mississippi Experiment Station at State College conducted a valuable series of irrigation tests, employing 12 varieties of cotton, the significant results of which are reproduced in Table 1. The average increase in yield, through periodic sprinkling of a total of the equivalent of six inches of rainfall, was about 200 pounds of lint per acre. Bobshaw 1A, Coker Wilt, Empire, Fox and Plains responded unusually well to irrigation in so far as increased yields were concerned. The value of the increased yields per acre of cotton and cottonseed ranged from $106 to $134 for these varieties.

[1] Caution and Thoroughness in Irrigation Stressed, a recent address made at a farmers meeting in Clarksdale, Miss., by Dr. Ivan Wood, Irrigation Specialist, Bureau of Reclamation.

F. L. GERDES

Table 1.—Cotton varieties with and without irrigation, State College, 1952.*

Variety	Pounds lint per acre			Total acre value, $		
	Irrigated	Not irrigated	Increase	Irrigated	Not irrigated	Increase
Plains	977	720	257	430	313	117
Coker, Wilt	923	633	290	415	281	134
Bobshaw 1A	915	645	270	399	282	117
Delfos 9169	914	792	122	413	351	62
Delfos 7343	893	720	173	396	312	84
Stoneville 2B	891	705	186	396	311	85
Empire	886	641	245	388	283	105
Fox	874	636	238	385	279	106
Hi-Bred	863	669	194	353	273	80
Deltapine 15	860	669	191	372	290	82
Arkot 2-1	842	687	155	375	306	69
Wilds	665	533	132	348	278	70

* Twelve Varieties of Cotton Used in Irrigation Test, Mississippi Farm Research, January 1953.

In irrigation tests made by the writer in 1954 and herewith reported for a variety of cotton, Bobshaw 1A, that responds well to irrigation as brought out in the State College tests, lint yield increases were directly associated with increases in frequency of irrigation (Table 2). On the Deer Creek sandy loam soil at Stoneville, lint yield gains per acre ranged from 130 pounds for two irrigations of about one inch of water each to 460 pounds for six irrigations totaling about six inches. On adjacent heavy bottom land which suffered less from deficiency in rainfall, the increases in lint yield range were 230 to 510 pounds. These better gains were attributed to the fact that the sandy land required more moisture to keep the cotton from "burning" and to facilitate fruiting than the blackland. The excessive heat during July and August was another factor limiting the increase in yield on the sandy land through irrigation. Otherwise, less water would have been required to make satisfactory gains in yield.

Other benefits from irrigation as brought out in the Stoneville tests were trends toward increases in gin turnout and improvements in many of the important qualities of the lint and cottonseed as the rate of irrigation was increased. The length of the fiber as measured with a fibrograph machine showed progressive increase with added amounts of water. The fiber coarseness became greater as the fiber length increased. Increased maturity on the sandy land was an evident factor, but on the blackland the fiber maturity was about the same for the non-irrigated and the irrigated cotton. The blackland having produced a normal crop of a bale to the acre without watering, as compared with a short crop of only half bale on the sandy land, accounts for some of the difference in fiber quality trends associated with irrigation.

It has been quite often observed that seasonal differences in fiber strength occur with differences in natural rain-

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Table 2.—Effects of different rates of irrigation on yield and quality of lint and oil and ammonia contents of cottonseed, produced on sandy land and blackland, crop of 1954—Bobshaw 1A cotton.

Irrigation treatment, no. of times [1]	Lint							Cottonseed			
	Yield per acre, pounds [2]	Gin turnout, percent	UHM length, inches	Micronaire (wt. per inch), micrograms	Strength, 1,000 lbs. per sq. in.	Maturity, percent	Grade, designation	Oil content, percent	Ammonia content, percent	Linters content, percent	Grade Index
Sandy land											
0	280	34	1.00	4.0	100	79	M	18.5	4.35	12.2	105.0
2	410	37	1.06	4.9	97	82	SLM+	19.0	4.19	11.7	106.0
4	620	37	1.07	5.0	99	83	M+	19.3	4.28	11.4	107.9
6	760	30	1.10	4.7	92	83	SLM+	19.5	3.95	11.5	106.5
Blackland											
0	490	30	1.03	4.6	98	84	M+	18.5	4.10	11.3	103.5
2	720	37	1.10	5.0	101	84	M+	19.6	3.85	11.3	106.5
4	860	35	1.12	4.8	95	83	SM—	20.0	3.80	12.4	108.0
6	1000	37	1.15	5.0	98	82	M+	20.0	3.85	11.7	108.0

[1] Irrigation rates were equivalent to one to two inches of rain, depending on the need.
[2] Based on boll counts—19.5 feet of rows, and allowing for frost-damaged boll loss.

fall during the boll development period, with the decreased fiber strength being associated with increased fiber length. This trend was evident in the case of cotton grown on sandy land. Here the non-irrigated cotton practically burned up. On the other hand, the blackland, non-irrigated cotton held up so well that fiber strength failed to be correlated inversely with fiber length, but averaged in the neighborhood of 98,000 pounds from the various lots of cotton.

The only significant observation on grade differences was that, with two out of the three irrigations on sandy land, the grades of the lint were lower than those for the non-irrigated cotton. Usually irrigated cotton locks are heavier or higher in moisture content than those of non-irrigated cotton and require more drying at the gin to make grades comparable to the badly burned dry cotton harvested on non-irrigated land.

In addition to the lint quality benefits derived from irrigation, the tests showed substantial increases in oil content of the cottonseed for all irrigated lots, ranging as high as one to 1.5 percent for those heavily irrigated. Ammonia content showed a decreasing trend—in contrast to the increasing trend in oil content usually the case in seed varying widely in oil content. Nevertheless, the net increase in grade index of the cottonseed ranged from one percent on two irrigations on sandy land to 4.5 percent for six irrigations on the blackland, showing a range of 65 cents to $3 per ton in the value of the seed.

• **Conclusion** — It should be emphasized that, due to the rough nature of the measurements of the factors studied, only trends should be considered because the absolute differences are highly variable. Yet some interesting trends were in evidence, and should provide a basis for consideration toward going into irrigation. Moreover, important "do" and "don't" practices were in evidence as the irrigation work progressed. Among the things that should be done to achieve maximum benefits from irrigation, as observed by the writer through experience, and observation supplemented by study of literature released by irrigation authorities, are:

1. Plan, the first year, to irrigate no more land than you can handle properly, thus growing into irrigation and obtaining experience on your own land.
2. Select the land best adapted to irrigation at the least cost, but at the same time plan to re-build the land on which cotton generally suffers from dry weather.
3. Following a good rain during the winter, it is worthwhile to make observations on the spread and run-off of the water in the middles, thus aiding in determining the effective layout of piping and other means for uniform irrigation.
4. Begin as soon as possible to prepare land for irrigation with emphasis on deep tillage.
5. Through engineering consultation, plan to use the most effective irrigation system for the terrain of the land, whether it be sprinkler, ditch and gated pipe or ditch and syphons or a combination of two or all three.
6. If creek, pond or river water is available, make sure of a season's supply. Otherwise, take steps for another source.
7. If well water is essential, plan for drilling as early as practicable.
8. Make whatever other land improvements that are basic to efficiency in irrigating by the method or methods chosen.
9. Study varietal characteristics that are desirable for maximum return from irrigation such as high boll set, thin foliage and others that hold boll rot to a minimum; and then book your order for breeder's or first-year seed of the variety chosen, taking into account varieties that respond best to irrigation from a yield increase standpoint.
10. In preparing for planting, use a row arrangement which results in uniform distribution of moisture over the field, and which holds water loss to a minimum.
11. Cultivate in a manner that moisture absorption of the soil is at the highest level. Make frequent cultivation for grass and weed control.
12. Begin applying moisture as soon as cotton begins fruiting, the amount depending on moisture deficiency in soil. Be sure to make irrigations as frequent as necessary to keep cotton from suffering from moisture deficiency.
13. Inaugurate comprehensive insect control program to be followed throughout fruiting season.
14. Lay the crop by in a clean manner so that hand pickers will not be reluctant to go into the rank cotton when free of grass and so that machines can harvest grass-free cotton, preventing unnecessary grade losses and expensive machine breakdowns.

People Don't Have To Eat Butter

Butter will never regain all of the markets it has lost to margarine, Secretary of Agriculture Ezra Taft Benson predicted in an interview while attending the National Cotton Council. He added that butter has and will recapture a portion of its lost markets through realistic pricing and sales promotion.

Making the point that butter priced itself out of the market, the Secretary commented, "You don't have to eat butter, and it couldn't compete with that good spread you make down here in the Cotton Belt." He added, as a warning on high cotton price supports, "You don't have to wear cotton, either."

The Secretary was introduced to another good cottonseed oil food while at Houston when he was given an opportunity to sample mellorine for the first time.

Valley Processors Make Cotton Contest Awards

John Robert Essary, 13-year-old 4-H Club boy of Milan, Tenn., won first place in the cotton yield contest sponsored by the Valley Oilseed Processors' Association. His record was 4,410 pounds of seed cotton from one acre. John's parents are Mr. and Mrs. John Essary.

Second place winner was John Trout of Newbern and third place winner was Larry Pegg of Lauderdale.

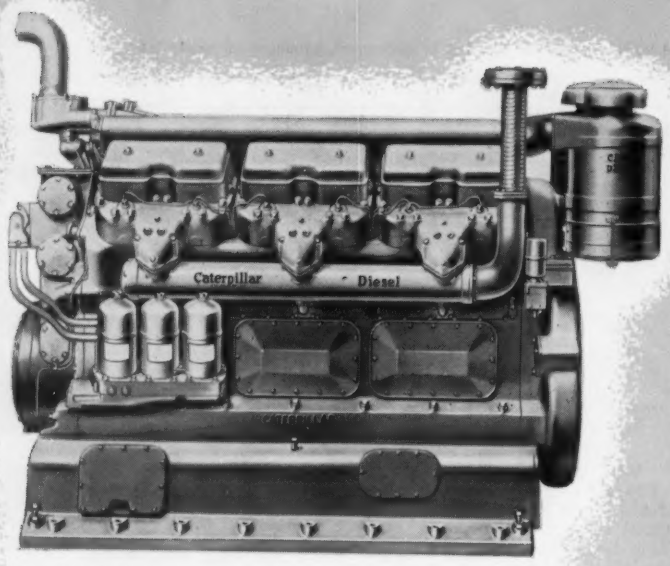
I. H. Fleming, Memphis, is president of the Valley group and C. E. Garner, Memphis, is secretary.

$5,000 Grant-in-Aid Given By Olin Mathieson Corp.

The Arkansas Experiment Station at Fayetteville has announced that Olin Mathieson Chemical Corp. has granted $5,000 to be used in a study of the ammonium phosphate types of fertilizers.

The grant-in-aid will be used in 1955 to conduct laboratory, greenhouse and field experiments relating to the availability of different sources of phosphorus to plant growth, particularly phosphate fertilizers containing ammonium in comparison with superphosphate.

■ **ROY L. LOVVORN, director of instruction, School of Agriculture, North Carolina State College, Raleigh, has been named director of research during the forthcoming two-year absence of R. W. CUMMINGS, who will head a technical mission to Peru. Lovvorn was head of USDA's weed control research program for three years.**



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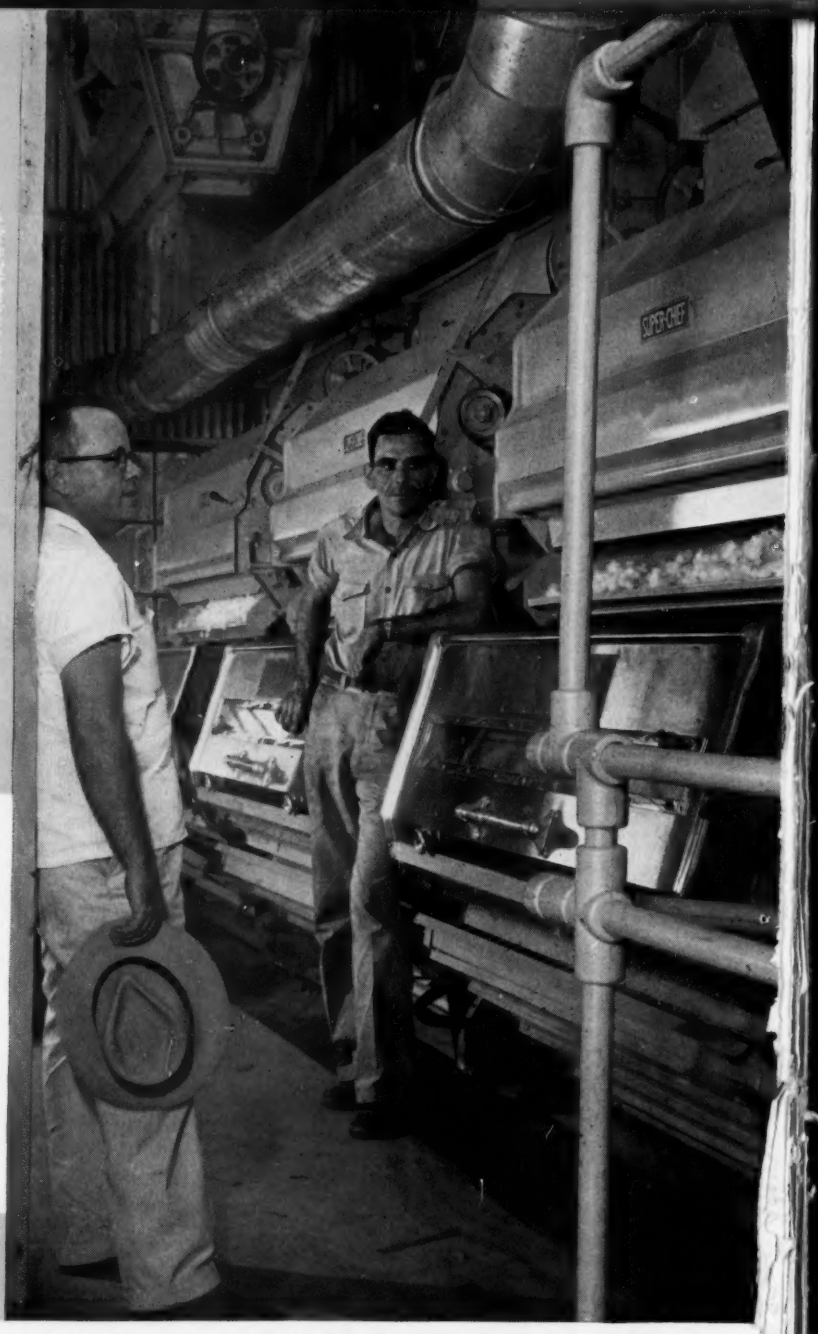

B. G. McGeary, owner, on left; Nason Holland, gin foreman, on right.

A Caterpillar D386 Cotton Gin Engine provides power for the entire B. G. McGeary Gin, Sidon, Miss. The plant includes a 3/90 Murray outfit with three Mitchell feeders, a 14′ burr machine and other equipment. Production of lint cotton averages 3 to 4 bales an hour in 10- to 12-hour days, 30 days a month, during the season.

In the D386's second season of use, B. G. McGeary had this to report about its performance: "It's simple to operate—no special operator is needed for it. It delivers ample power for a complete ginning plant. So far, there's been no down time, practically no adjustments and a minimum of repairs. I know that if I need service, I can get it 24 hours a day."

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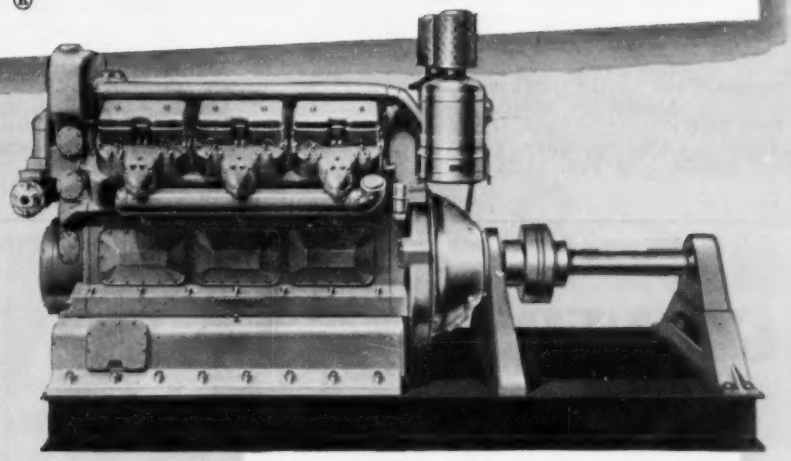

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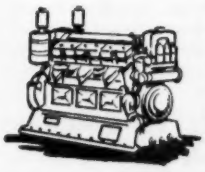

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In Oklahoma City, Feb. 23-24

Oklahoma Ginners Plan Meeting

■ **SPEAKERS include Bishopp, Comer. Vocational agriculture and farm unit programs to be discussed at convention.**

Program plans for the Oklahoma Cotton Ginners' Association annual meeting have been announced by J. D. Fleming, Oklahoma City, secretary. The convention will be held Feb. 23-24 at the Skirvin Tower Hotel in Oklahoma City.

Registration Wednesday morning will start at 9:30 and continue through 12 noon, and the first session will open at 1 p.m.

A feature of the program will be a colored sound film showing part of the Maid of Cotton Contest held in Memphis in January. De Lois Faulkner, Oklahoma entrant, was named 1955 Maid of Cotton at that time.

A discussion of the vocational agriculture program in Oklahoma will be presented by J. B. Perky, state director, and F. C. Bishopp, Brownsville, Texas, coordinator of the pink bollworm research program, is scheduled to make a progress report on this work.

Harry Canup, director of the school of commerce, Extension Department, Oklahoma A. & M. College, will pose the question, "Is the Price of Cotton Too High?"

At the Wednesday evening banquet, Hugh M. Comer, chairman of the board of Avondale Mills, Sylacauga, Ala., will address the group.

On Feb. 24 committee reports and election of officers are scheduled. Following this business, D. B. Jeffrey, farm management specialist, Oklahoma Extension Service, and Vernon J. Frye, Cleveland County Agent, will discuss the farm unit approach to the farm and home development program in Oklahoma.

Officers of the Oklahoma Ginners for 1954-55, in addition to Secretary Fleming, are Elmer Dawson, Mt. View, president: M. N. Panell, Lawton, first vice-president; and L. T. Palmer, Okemah, second vice-president.

ELMER DAWSON, Mt. View, is 1954-55 president of the Oklahoma Ginners. He has been named Oklahoma's ginner of the year.

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• Irrigation Seminar Hears Johnston

MORE THAN 300 agricultural leaders, engineers, farmers and others interested in irrigation attended an irrigation seminar in Greenville, Miss., Jan. 27-28-29.

Tom Johnston, associate agricultural engineer with the Mississippi Extension Service, told the group that "irrigation should fit in the general farm plan just like mechanization, fertilization, weed control or any other phase of operation.

"To operate successfully, irrigation must start with a plan and that plan must be worked out carefully. The plan for irrigation should start with topographical mapping and should include a soils map.

"With these maps a farmer can determine row direction, furrow length and the crops best suited to particular fields," Johnston said.

USDA Wants To Sell Ghee

The U.S. is working on plans to sell ghee to India and Pakistan as part of the program of reducing CCC's stocks of butter. Ghee, a white, mushy substance made by melting butter and pouring off the more liquid part, is a popular food among Hindus and other Orientals, particularly the more wealthy.

• Factors in Planning Irrigation Listed

THE AMOUNT of water that is required to irrigate an acre often surprises farmers who have not irrigated in the past. Theoretically, we must pump 27,154 gallons of water to provide the equivalent of one inch of rain on one acre, R. C. Tallon, manager, irrigation division, Noland Co., Inc., Atlanta, said recently.

Tallon was one of the speakers at a short course on farm ponds and irrigation at Abraham Baldwin Agricultural College, Tifton, Ga.

The average irrigation system for that section of Georgia, he said, is designed on a minimum of 1½ inch application, which means that 40,731 gallons must be pumped to get the equivalent of 1½ inches of rainfall. The system must be capable of applying this much water on a given amount of acreage in 10 working days.

Using the irrigation of a 10-acre tract as an example, Tallon calculated that it would require the pumping of 68 gallons a minute for 10 hours a day for 10 days to apply the equivalent of 1½ inches of rainfall on 10 acres. This, he pointed out, amounts to the distribution of 3,393,000 pounds of water over the area.

He listed the following factors which must be taken into consideration in designing an irrigation system:

1. Water holding capacity of the soil profile.
2. Infiltration rate.
3. Root zone of crops to be irrigated.
4. Water consumption rate of crop.
5. Hours of operation.
6. Source and capacity of water.

These factors should be classified as soil characteristics and crop water requirements, he said. Under equipment design, factors to consider include:

1. Pump lift.
2. Elevation.
3. Height of sprinkler risers.
4. Friction loss in main line.
5. Friction loss in lateral lines.
6. Sprinkler operating pressure.
7. Type of power unit.

Other factors to determine in the physical layout of the system would be:

1. Size and shape of field to be irrigated.
2. Topography.
3. Source of water in relation to the fields to be irrigated.
4. Labor available for moving laterals.
5. Direction of rows.
6. Farmer's financial position.

Hoover Dam and Ferry Help Arizona Desert To Bloom

The Cibola Valley in Arizona, which is most easily reached by river ferry, is being developed into an oasis in the desert. People have known about its rich soil for a long time, but development has been hampered until recently by poor roads and by devastating floods from the Colorado River.

Building the Hoover Dam stopped the floods and an ingenious ferry has solved the transportation problem, so the Cibola Valley is booming. Yields of two bales of cotton per acre and over are not unusual. There is still plenty of undeveloped land in the valley, covered with salt cedar, mesquite, willows and arrowweed.

Alabama Planting Seed Adequate in 1955

Although there is not a big surplus, seed supplies of recommended cotton varieties for Alabama will be adequate for 1955 plantings, says Ralph R. Jones, Alabama Extension Service.

Total supply will be somewhat less than last year's, and certified seed will run shorter than non-certified.

Jones cautioned farmers to watch analysis tags for the germination rates of cottonseed, since the drouth badly damaged the planting value of some seed. Seed should germinate at least 80 percent, he said.

In North Carolina there is a good supply of planting seed, according to the State Cotton Working Committee. The Committee urges farmers to have germination tests made on seed, as well as to arrange to have seed delinted and treated for seed borne diseases.

Soil Fumigation Helps

Soil fumigants applied to lands heavily infested with nematodes have doubled peanut yields in tests in Alabama. Use of Dowfume 2-85 at the rate of 4½ gallons per acre gave control of nematodes and increased the number of sound, mature peanut kernels.

■ **S. J. VAUGHAN, III, Hillsboro, Texas, son of S. J. VAUGHAN, Jr., has been named vice-president of the Hillsboro Chamber of Commerce. The Vaughans are vice-president and president, respectively, of Hill County Cotton Oil Co.**

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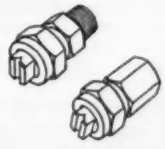

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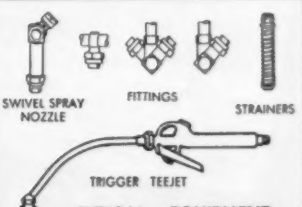

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• Wind Tunnel Helps War on Erosion

STUBBLE - MULCH cropping, shelter belts and strip cropping for normal years, and surface clodding for the eight extremely dry years in each century, appear to be the best answers to wind erosion on the Great Plains.

Stubble farming is capable of protecting the land most years, USDA points out, but 1954 was one of those occasional blighted years when there's no effective vegetal cover, dead or alive. Proper emergency tillage will help at such times to save even bare soil of most types, says an article in a recent issue of Agricultural Research.

• **Wind Tunnel Used** — Wind erosion studies of soil particle structure and behavior are being conducted in a wind tunnel at Manhattan, Kans., by A. W. Zingg and associates of USDA.

Preventing soil particles from getting into motion and halting their destructive sweep across fields are keys to controlling erosion. Knowledge of these phenomena came from wind - tunnel studies. High-speed photographs of moving soil, and analysis of particle-size make-up of blown soil, showed how it happens.

The finest silt and clay dust particles nestle in the surface grain of the soil and avoid the wind. But gusty wind as light as eight m. p. h. will move medium particles—cause them to roll along the ground and, on collision with other elastic particles, to bound into the air, spinning 200 to 1,000 r. p. m. By this dramatic leaping and jumping action called saltation, they can traverse a field—usually moving a fifth or a fourth as far up as forward. The stronger the push of the wind, the higher the bounce and the longer the glide.

When a saltating grain strikes fine, wind-proof particles, it projects them into the air where, suspended, they float long distances. When it strikes large nonblowable particles or when the wind dislodges coarse particles, they roll in a sort of surface creep.

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In wind-tunnel studies, topsoils of fairly high clay and clay-loam content erode till projecting clods shelter the remaining blow soil against the wind. A cloddy bed such as that, stabilized by man and not by wind, is the goal when cover is not available.

It takes quite a bit of clay or fine silt and sometimes moisture to form clods. On sandy lands of the plains, much of the clay and silt has been lost from the plow layer—must be brought up from the subsoil. The field is strip-plowed with chisels (4 inches wide, 24 inches apart, and 12 to 18 inches deep). Where this has been tried, from 10 to 50 percent of the land was turned at each plowing. Emergency tillage of this type should start ahead of the spring blow period and rotate across the field —a new strip at each sign of erosion.

• **Field Erosion Data** — Some valuable lessons have been learned from field erosion history, too. As wind moves across erodible land, it needs greatest velocity at the starting edge to move soil. Surface crust and clods there resist erosion. But in absence of obstructions—windbreaks, crop residues, surface roughness—it proceeds across the area, sorting out organic matter, fine silt, and clay and depositing them to leeward. Sand remains behind—coarsens the windward part of the field, lowers its fertility and ability to grow vegetative cover, and leaves it more erodible. To leeward, the leveling, increasingly-erosive deposits become progressively more vulnerable to milder winds.

Erosion can be tamed, therefore (sometimes in the absence of stubble cover) by shortening its downwind range. Furrows plowed crosswind help some, but erosion soon fills them. USDA is studying combinations of grass cover, strips of varying plant types and spacing, and all possible devices to develop a workable system for a dust-free plains agriculture. But permanent sod appears to be the only answer for some shallow sandy lands.

Soil Fumigation Proves Value in Cotton Field

Soil fumigation to control wilt and nematodes was tested on several farms in Phillips County, Arkansas, with excellent results in some cases, this season.

W. E. Bailey and Son had a 20-acre field that had never made more than 16 bales of cotton, even under the most favorable conditions. In recent years, about one-fourth of the cotton in the field died out before the middle of the season. The 20 acres were fumigated at a total cost of $200 this season and produced nearly 30 bales of cotton.

Automatic Control Invented

A Phoenix engineer, Ike Jenkins, has invented an automatic irrigation control which closes the head gate as soon as the desired amount of water has gone on land, according to a recent issue of Southwest Electrical.

Depth of the water flowing on land is controlled by two brass screws on an insulated strip, which is set upright. When water reaches both of the brass screws, an electric current energizes a relay which shuts the gate and stops the flow.

QUOTES FROM OUR AUTHORS

"The ginning industry does not have the complete answer, through research, but the equipment now available to the ginner, when used properly, will make mechanical harvesting methods profitable." — Charles M. Merkel and Vernon P. Moore.

General Irrigation Rules Outlined in Arizona

Some general rules for irrigating cotton are outlined in the bulletin, Maricopa County (Arizona) Field Crops—1955. The publication was compiled and edited by James R. Carter, Assistant County Agent.

Proper irrigation is essential for a high yield of good cotton, the bulletin emphasizes. Practices will vary with soil, availability of water and weather conditions. Some general pointers to remember include these:

1. A heavy irrigation prior to planting should be made, wetting the soil evenly to a depth of six feet (a full acre-foot of water on most soils).

2. If an irrigation is given in late spring, before the soil warms up, it will retard plant growth. If delayed until after June 1, (with normal planting time) decreased yields will usually result. Best data seem to show that the first irrigation after planting should be made between May 15 and June 1.

3. Withholding irrigation water after planting, and before blooming, until plants show definite water stress is a poor practice. Roots do not develop in dry soils.

4. Cotton plants should be allowed to use up available moisture supplies more completely between irrigations during the fruiting period than earlier in the season.

5. Regulations of irrigation will aid in controlling excessive vegetative growth during the fruiting period even though the plants had been stimulated into rapid growth prior to heavy fruiting.

6. Plants which grow most rapidly from planting to fruiting and continue with slow, even growth from mid-summer to September are the highest producers.

7. Once the lower root zones are filled with water during the irrigation prior to planting, they may be forgotten for balance of the season, so long as the "working depth" (top three feet) is kept refilled.

8. The heaviest water use is from the first foot of soil; the second heaviest is from the second foot, and the amount decreases as the depth increases.

9. The "reserve water" in the fourth to sixth foot of soil plays an important part in protection against temporary water stress between irrigations.

10. The plant indicates when it is becoming water stressed by a change in its color to a darker green and by the loss of a cool feeling of the leaf.

11. "The best time to irrigate is just before the plant needs it!" Irrigate to the plant, and its growth.

• Fighting Irish War On Germs in Lab

THE FIGHTING IRISH of the gridiron are hardly more famous than another Notre Dame institution is in its own field — scientific research.

World research on germfree animals is centered at Lobund Institute — the "initial name" for Laboratories of Bacteriology, University of Notre Dame. This unique laboratory and its animal study are described in a recent issue of Becco Echo, published by Becco Sales Corp., Buffalo, N.Y.

Lobund produces germfree animals for research in nutrition, animal ills, fundamental biology and medicine. Germfree life offers an opportunity to determine the effect of single micro-organisms; and efforts were made as early as 1895 to grow germfree animals. These early efforts failed because sterilization destroyed vitamins, unknown at the time, and animals died from malnutrition.

• **Clean, Happy Life** — Even with the best of modern knowledge, says the article, it took years of trial and error to produce germfree animals at Lobund. In order to get the growing organism in a germfree condition, mammals are taken from the mother by Caesarian birth, and chickens are hatched from fertile eggs that have been sterilized.

Birth or hatching occurs in a sterilized chamber provided with germfree air. Technicians work from outside the chamber through flexible rubber gloves that are sealed in the chamber walls, and observe through a sight-glass at the top.

After birth, the infants are passed through a sterile lock to a living chamber identical with their birthplace. Attendants provide 24-hour room service. For feeding grown animals, attendants wear rough cotton gloves over the fixed rubber gloves. The cotton gloves are sterilized in the lock, like everything else that goes into the cage, and protect the rubber gloves against nips which might puncture them and end sterility. The animals are as lively, and seem as happy, as any household pet.

• **Started in 1928** — Dr. James A. Reyniers, now Lobund director, began the research in 1928 as a result of his interest in Pasteur's theory that animals could not live without germs. Lobund now has a staff of more than 60 and is well along on a 50-year research program envisioned by its founder.

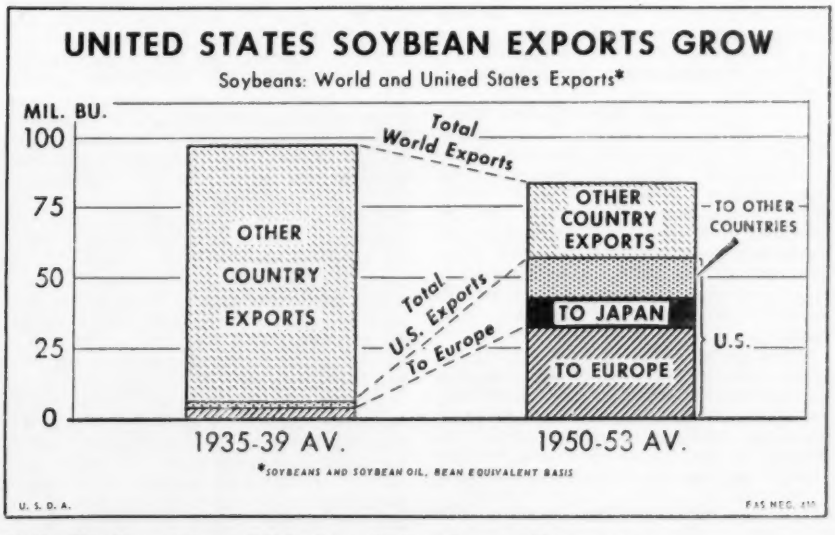
After it was found that animals could live without germs and even — for the first time in history — breed under sterile conditions, the problem arose of producing enough animals for the many studies planned, says the Becco Echo article.

"The small chambers for birth and temporary living and specific experimentation have been supplemented by a huge colony chamber which holds hundreds of animals under the same sterile conditions which prevail in the small chambers. As originally planned the technician who attends to the highly disciplined household chores of the colony was sealed in a plastic diving suit and entered through a sterile lock. Here he was elaborately sprayed with detergent. He then passed into a germicide chamber where he remained submerged for a half-hour while freeing his protective suit from all air bubbles. He was then ready for work in the sterile animal chamber.

"The colony chamber and its accessories are now being rebuilt to take account of the discovery that a simple spraying of the protective garment with atomized peracetic acid plus a 10-minute one percent peracetic acid shower in the sterile entrance lock is all the protection needed.

"Current or recent projects at Lobund Institute are studies of dental decay, radiation sickness, amoebic dysentery, shock, cancer, and lymphomatosis, a disease of chickens believed to be akin to cancer in man. Such projects are 'applied science' and to that extent a diversion from Lobund's basic objective of pure research, which, by discerning isolated causes and effects indicates paths which other scientists and industry can follow to create broad social benefits.

"As to tooth decay, for example, Lobund researchers have established a diet which will produce 98 percent tooth decay in 150 days in ordinary germ-laden rats. Germfree rats on the same diet (sterilized) show not even microscopic evidence of decay. Plainly, there is something in common germs — not in the basic characteristic of the food — which causes tooth decay. Now each characteristic germ can be tried on otherwise germfree rats until one or a combination of the germs is determined to be specifically the cause of tooth decay. Then, industry can take over and give broad application to what Lobund researchers have learned about tooth decay."



U.S. Makes Two-Thirds of Soybean Exports

THE SHARP RISE in exports of U.S. soybeans and soybean oil in recent years, as compared with the 1935-39 average, is shown above. USDA reports that this country's exports during the 1950-53 period accounted for two-thirds of the world's trade in these products. Soybean exports this season may reach a new high.

Factors for Successful Irrigation Are Listed

Success of a venture in irrigation farming rests on two major factors, according to T. H. Quackenbush, Washington, Soil Conservation Service.

The first of these is the proper design of a system to fit the individual farm. The other major factor is proper operation of the system in accordance with the standards of the original design.

Many well designed irrigation systems fail, the USDA authority added, because of improper operation. Likewise, misfit equipment and poor planning can make it impossible for operations to be efficient. To avoid either problem, farmers should make sure that their irrigation system is properly designed by a competent engineer and that equipment is purchased from a reputable firm.

Quackenbush said that it is a common mistake of many new irrigators in humid areas to depend too much on rainfall.

"Most of us wait too long to start irrigating," he commented. "We keep hoping for rain. But here's some good advice: don't look up to the sky; instead, look at the ground and put water on when the soil needs it."

The tendency of many irrigators to shut off their systems the minute it starts to rain causes considerable difficulty. Quackenbush reminded farmers that on most soils they will be applying at least two inches of water each time they irrigate. If a half-inch rain comes they should cut down their application to 1.5 inches, but not stop completely.

It may seem silly, he added, to be moving irrigation pipe or tending irrigation ditches in a slicker with rainwater dripping off your nose; but the man who really knows what he's doing keeps a slicker as part of his irrigation equipment. He takes advantage of all of the rain he gets, but doesn't depend on it. He relies on his irrigation system.

British Machine Simplifies

A new type of worsted yarn drawing machine is in production in Yorkshire, England, and the manufacturers, Prince-Smith and Stells, Ltd., report that firms in 11 countries, including the U.S., have already placed orders.

The machine, called the Raper Autoleveler, was designed to make wool slivers regular in weight and thickness, thus eliminating the necessity for numerous drawing operations before the actual spinning process.

The apparatus, which was invented by George Raper, is reported to reduce by half the number of processes required to obtain yarn of even thickness.

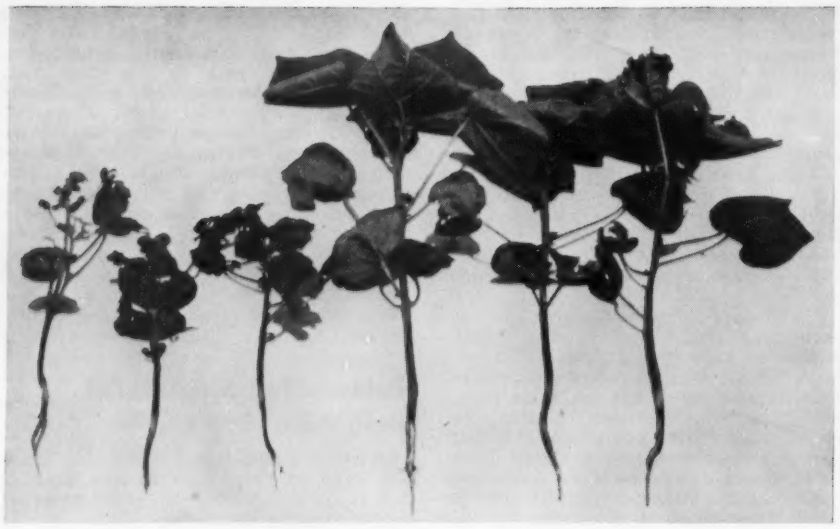


Figure 1.—The three plants on the left were grown from untreated seed and show severe thrips damage. Those on the right were grown in an adjacent field from seed treated with a systemic compound at Waco in 1954. The material used in this test was American Cyanamid 12008.

K. P. EWING is in charge of the section of insects affecting cotton and other fiber plants, Entomology Research Branch, ARS, USDA.

Cotton Insect Research and Control

What about risking the loss of beneficial insects? What is the status of the promising new systemic poisons? What is the key to successful programs of insect control? These and other problems facing today's cotton farmers are discussed here.

THE FEAR expressed by some entomologists concerning the use of insecticides for controlling injurious insects is cause for alarm. At the annual meeting of the Entomological Society of America in Houston Dec. 6-9, 1954, one speaker, far removed from any cotton field and apparently without knowledge of current cotton insect problems and control developments, said in essence: "It doesn't make sense to use insecticides to control the boll weevil and at the same time increase bollworms by killing off beneficial insects."

It would be difficult indeed to convince farmers who have reaped net profits of $50 to $150 per acre from the use of insecticides to control the boll weevil that such a practice did not make sense. It is true that in many cases, but certainly not in all cases, the bollworm had to be controlled also. However, with the combinations of insecticides which have been developed for the dual control of these insects, both insects can be controlled effectively and with adequate returns for the investment.

The bollworm often has to be controlled with prior use of insecticides for control of the boll weevil or other cotton insects. Predators and parasites often keep bollworm infestations below damaging numbers, but they cannot always be depended upon to do this. Bollworms have often been observed to destroy one-half to one bale of cotton per acre on plots or fields where insecticides were never used. In fact, long before the boll weevil invaded this country and before any insecticide was ever used in a cotton field, the bollworm was a serious pest of cotton, often destroying the entire crop in individual fields.

• **Can't Rely on Predators** — Unfortunately, predators and parasites have never given much benefit in controlling the boll weevil. When boll weevils get a good start early in the season and weather conditions are favorable for their increase later in the season, there is only one way to prevent serious damage to or even total destruction of the cotton crop, and that is through the judicious use of insecticides.

There is no reason for a farmer to sit idly by and let the boll weevil eat up his cotton crop just because the use of insecticides **may** cause bollworms to increase. Especially is this true when the bollworm can also be controlled with insecticides at a comparatively small cost. There are several insecticides or combinations of insecticides that do a good job, when properly applied, in controlling both the boll weevil and the bollworm.

If I were a cotton farmer and had a choice between raising a bumper crop of beneficial insects and one-fourth bale per acre or controlling the insects (beneficial as well as injurious) and harvesting one bale per acre, I do not think it would take me long to chart my course.

• **Timing Helps Beneficial Insects**—I do not mean by this that we should ignore the value of beneficial insects. I want to emphasize this point. We should do everything possible to protect and use them to the best possible advantage.

A great deal of research has been conducted on beneficial insects that occur in cotton fields, and it has been determined that most of the widely used insecticides are highly toxic against them. The research studies have included the importance and abundance of the major species of beneficial insects, the toxicity of different insecticides to the different species, and the proper timing of applications for maximum protection of beneficial insects, especially those helping most to control aphids, spider mites, and bollworms. These studies are being continued and need to be expanded, because the problems are complicated and vary in different localities.

A great deal of educational work has been done in some states to teach farmers to identify and protect beneficial insects that occur in their cotton. Colored slides have been made of the most important species and, together with descriptive material, have been widely used by county agents and others in an educational campaign.

During the summer of 1954 E. F. Knipling, chief of the Entomology Research Branch, and I visited cotton fields at several locations in Texas and talked to farmers about their insect problems. After our tour was over he remarked he was surprised to find that so many farmers know so much about beneficial insects—and how to time and use insecticides to control injurious species but give maximum protection to the beneficial ones.

(Continued on Page 83)

By K. P. EWING

The research center at Brownsville, Texas, was dedicated about a year ago. Here is a review of the first year's activities and an outline of future plans for study of a major pest.

Expanded Pink Bollworm Research

By SLOAN E. JONES

THE EXPANDED pink bollworm research program has just had a birthday. The new laboratory building at the Pink Bollworm Research Center, Brownsville, Texas, was dedicated Jan. 24, 1954. Let us review this first year's work and make plans for the future.

Alabama, Arkansas, Georgia, Louisiana, Mississippi and Texas, the United States Department of Agriculture and the Oscar Johnston Cotton Foundation share in the expanded pink bollworm research program. Headquarters are at Brownsville with sub-laboratories at Lubbock and Port Lavaca, Texas, and Torreon, Coah., Mexico. Consideration is now being given to conducting certain phases of the research at the Waco, Texas, laboratory.

In addition to this, the Texas Experiment Station also conducts research on the pink bollworm at College Station and other locations in Texas. Dr. F. C. Bishopp is coordinator of the program with headquarters at the Pink Bollworm Research Center.

An important forward step was taken recently when Dr. R. D. Lewis, administrative adviser for cotton insect investigations in the Southern States, at the request of the directors of state agriculture experiment stations in the Southern region, appointed a Pink Bollworm Technical Research Committee. This committee is composed of one entomologist from each of the 12 leading cotton producing states and one from Puerto Rico, four representatives from different units of USDA and one from the National Cotton Council. The function of this committee is to aid in the development and future planning of the coordinated program, to review the progress being made and to establish liaison with cooperating states and agencies.

• **Experienced Staff** — The Research Center is fortunate in having on the staff such experienced men as Chapman, Noble, Richmond, McGarr, Robertson, Shiller, Rude, Currie, Fife, Walton, Lowry and others. Each has had more than 10 years' experience in pink bollworm research or control. Most of them have spent time at the Presidio laboratory (now closed) where much valuable research on this insect was done.

They know what it is to do research without adequate help, equipment or money. However, they lived close to the pink bollworm and learned well many of its habits, weaknesses and strong points. Their intimate knowledge of its destructiveness and the difficulty of reaching and killing the worms with insecticides make them respect it as a serious enemy. They also know the cotton crop and the problems facing a grower.

The expanded research program embraces 14 research projects or lines of work that are already under way. Research on possible use of pathogenic organisms to control the pink bollworm will be started as soon as a specialist in insect pathology can be employed. All phases of the program are designed to get information that can be used in controlling the pest. Every promising means of controlling the pink bollworm is being or will be investigated as funds and personnel become available.

Research workers are seeking effective control measures that will fit into a modern cotton production program with as little additional cost as possible. It is hoped that by making slight changes in cultural practices and insecticide programs the pink bollworm, together with other insects, can be profitably controlled. Insect control must fit into a cotton production program along with plant disease and weed control, soil fertilization and conservation, defoliation and mechanical harvesting and total cotton mechanization.

• **Hibernation Research** — Hibernation of the pink bollworm is being investigated at Brownsville, Port Lavaca, Waco, Greenville, Mt. Pleasant, Lubbock and Vernon, Texas, and Chickasha, Okla. These studies provide information on survival when infested bolls are left on stalks and buried in the spring, placed on the surface of the soil and buried in the fall or spring, or not buried at all. Information obtained from these tests is used in formulating recommendations to farmers as to the most practical cultural treatments to use in destroying over-wintering pink bollworms.

In view of the extreme importance of hibernation research, it should be increased. Experiments should be designed to determine the survival under various treatments in areas where the rainfall and humidity are high. This information should be available before the infestation spreads farther east.

In connection with the spread of the pink bollworm, alternate host plants become of greater importance. While okra is the principal cultivated host other than cotton, the pink bollworm is known to live and breed on several wild plants in South Texas. A complete list of the host plants and their possible importance in control methods should be known in areas where efforts are being made to suppress or eradicate infestations.

Chemical control is being investigated in field experiments and in the laboratory. Many chemicals are being tested in the laboratory and the more promising ones are tested under field conditions.

Of particular interest now are the systemic poisons that are taken up by the plant and translocated in lethal dosages to all its parts. Finding a systemic poison that would effectively control the pink bollworm would be especially desirable since it is so difficult to reach with ordinary dusts or sprays. Furthermore, it would be unlikely to kill beneficial insects.

• **A Mechanical Killer** — Since pink bollworms pass the winter in the larval stage, usually in bolls or other crop residue, effort is being made to find ways of mechanically killing these worms. The Texas Experiment Station has leadership in the developement of machinery for this purpose. Much emphasis should be placed on this work as it offers promise of being the best way of destroying the over-wintering worms in the field.

Another study seeks better ways of

At left is a pink bollworm in action in boll of cotton. SLOAN E. JONES, author of this article, is station leader at the Pink Bollworm Research Center, Brownsville.

killing pink bollworms in seed cotton at the gin. Research is under way to find a more satisfactory method of killing worms in seeds than through heat sterilization during ginning. An impact machine on the order of an Entoleter is effective, but damages some seeds. The effect of various delinting and seed treatments on infested planting seeds should be determined. Effort is also being made to find more satisfactory ways of killing pink bollworms in oil mill products. This work is very important and is being pushed as much as available funds will permit.

Light traps are being used to detect outbreaks and in migration studies. Flight studies of pink bollworm moths are also being conducted by the use of traps mounted on an airplane. Further studies of the moths' night activities and flight will be made by the use of infrared lights.

• **Basic Information on Bollworm** — A great deal of information is needed on the biology, physiology and biochemistry of this insect. When more is known about the fundamental nature of the pink bollworm, advantage may be taken of certain weaknesses to attack effectively a vulnerable point in its life cycle.

A satisfactory explanation cannot be given for the great variation in the survival of the over-wintering larvae. Dr. E. W. Clark is being sent to the Atomic Energy Commission's Oak Ridge Laboratory to take the course in radioisotopes in order that this tool may be used in the research program. An effort is being made to learn more about the dietary requirements of the larvae. This information is needed in learning how to rear specimens artificially for testing poisons. It might also throw some light on the cause of development of over-wintering long-cycle larvae.

The bioclimatic cabinets are now in operation, partly in connection with fruit fly investigations. Research is under way to determine the effect of certain weather conditions on hibernating larvae. It is hoped that information gained from these studies will be useful in predicting survival under various climatic conditions that exist in some of the states that are not now infested with pink bollworms.

Biological control research is under way. Beneficial insects that attack the pink bollworm in India are being collected and sent here for testing in Texas and Mexico. Many lots of these beneficial insects have been liberated in infested areas to determine their effectiveness and ability to survive.

The coordinated pink bollworm research program is young. Progress, as a whole, has been satisfactory. In some phases of the work it is better than was expected. The research program, as first planned, is sound. Some aspects may need strengthening in light of the more recent spread eastward of the pink bollworm. While the program is somewhat flexible, care must be exercised in undertaking additional work at the expense of that already started.

The cooperative participation in the research program of states not now invaded by the pest is fully justified on the basis of finding ways of checking the spread, of developing control measures and of giving experience to entomologists in non-infested states before the pink bollworm becomes established in those states. As in military warfare, battles are most destructive and expensive when fought on home territory.

FACT

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THORNTON HAMILTON, Cuero, Texas, was born in Cuero and has been active in the crushing industry for 45 years. He is president and general manager of the Cuero, Kenedy and Yorktown Cotton Oil Mills.

Hamilton succeeded his father, who was in the cotton oil business for 15 years.

• Cooperative Gins Meet at Hobart

TWO HUNDRED persons attended the annual meeting of The Farmers Union Cooperative Ginners' Association of Oklahoma Feb. 4 at Hobart, in spite of bad weather. Forty-two cooperative gins were represented at the meeting.

C. A. Holmberg, Erick, was re-elected president and H. M. Gilbreth, Frederick, re-elected vice-president, at a directors' meeting following the general sessions. Mrs. Lucile Millwee, Carnegie, was re-elected secretary-treasurer for her fourth term.

Holmberg and Albin Nixon, Anadarko, were re-elected to the board of directors.

Features of the meeting included an address by B. E. Stallones of Houston and entertainment by the Alden 4-H Club.

New Book

PROCEEDINGS OF SYMPOSIUM ON FOOD COLOR ISSUED

Color measurements in food and other subjects are discussed in the proceedings of a symposium, Color in Foods, issued by the National Academy of Sciences-National Research Council.

Research workers in the field covered by the subject matter may obtain free copies from Quartermaster Food and Container Institute for the Armed Forces, 1819 West Pershing Road, Chicago 9.

Gandy Discusses Feeding

DALTON E. GANDY, NCPA field representative in the Mississippi Valley area, discussed self feeding of meal and salt mixtures at Little Rock Feb. 8 on the program of the first annual statewide beef cattle meeting sponsored by Arkansas Beef Cattlemen's Council. Organizations making up the Council include Arkansas Angus Association, Arkansas Brahman Association, Arkansas Hereford Association, Arkansas Polled Hereford Association, Arkansas Shorthorn Association, Eastern Arkansas Livestock Association, Southwest Arkansas Feeder Calf Sale Association, Evening Shade Feeder Calf Sale Association, and livestock committee of livestock commodity section of the Arkansas Farm Bureau.

Ed Stevens, Dawson Peanut Operator, Found Dead

Ed Stevens, Dawson, Ga., widely known in the peanut and cottonseed industries, was found dead in the bedroom of his home on Feb. 1. Services were held Feb. 2 at Dawson Methodist Church.

He was chairman of the board of Stevens Industries, which includes the Dawson Cotton Oil Co., Cinderella Foods, and the S and W Co., a hardware, feed and seed business. He was vice-president of the Southeastern Peanut Association, which he helped organize in 1918.

He is survived by his wife; two daughters, Mrs. M. E. Williams and Mrs. R. G. Dozier, of Dawson; one sister, one brother, and several grandchildren.

• Clinic on Processing Studies Problems

PROBLEMS of oilseed processing were studied by representatives of the cottonseed crushing industry and research workers in New Orleans Feb. 7-8 during the fourth Cottonseed Processing Clinic at the Southern Regional Research Laboratory. Clinic sponsors are USDA and Valley Oilseed Processors' Association.

The two-day program included papers presented by research workers of USDA's Southern Utilization Research Branch, discussions of oil milling problems by industry members and reports of committees.

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Water Makes the Difference

(Continued from Page 10)

sprinkler irrigated, usually on rough land. An estimated 10 percent of cotton irrigation, after planting, in California is done by flood irrigation.

Recent research on irrigation in California indicates that the cotton plant has a very poor root system when young. Although the tap root does grow extensively, it does not fill in the area between the rows for some period of time, and early irrigations appear to be beneficial. This is particularly true on the light, sandy soils which have a low water-holding capacity.

Many of our light soils contain nematodes, and they reduce or destroy the effectiveness of the root system, thus increasing the frequency of irrigations. The number of irrigations on the light, sandy soils with nematodes totals 12 or more per season, and during July and August, the plants should be irrigated about once a week.

On heavier soils nematodes are not a problem, and cotton may be irrigated as few as two or three times a season. Not including the pre-irrigation, the requirements for cotton are from 18 to 24 inches of water. Including the pre-irrigation, the total requirement is about 30 inches.—*L. D. Doneen, Professor of Irrigation, University of California, Davis.*

• **Georgia**—Nearly 28,000 acres of cropland were irrigated in Georgia in 1954. Roughly one-third of this was pasture land, and another third was tobacco, truck crops and corn. Cotton grown under irrigation in 1954 totaled 276 acres.

An Extension Service survey shows that Lowndes County irrigated 1,645 acres—the highest total in Georgia in 1954. Other high-ranking counties include Decatur with 1,000, Tattnall and Evans with 950 each, and Thomas Brooks and Bulloch with about 800 each. Total number of irrigation systems in the state was 792.—*Willis E. Huston, Agricultural Engineer, Georgia Extension Service, Athens.*

• **Louisiana** — In 1953 approximately 5,000 acres of cotton were irrigated in Louisiana. Because of the dry weather that prevailed in 1953, more farms were equipped in 1954. An estimated 10,000 to 15,000 acres of cotton received supplemental irrigation in 1954.—*William H. Patrick, Jr., Assistant Agronomist, Louisiana State University, Baton Rouge.*

• **Mississippi** — In the 1954 season farmers in the Mississippi Delta irrigated between 40,000 and 50,000 acres of cotton, according to estimates based on records made by county agents.

Probably there were less than 5,000 acres irrigated in any previous year, and indications are that 1955 may see from 150,000 to 200,000 acres of cotton under irrigation in the Delta, provided that the need exists.

Both sprinkler and furrow methods were used—probably about 50-50.

Farmers were slightly late with their first application of water and did not, therefore, obtain maximum benefits, although many producers felt that supplemental irrigation increased yields by from one-half to three-fourths bale per acre.

In general, there was insufficient preparation for irrigation, the water was applied too fast and too much time elapsed between applications. However, almost everyone profited from irrigation, even though techniques could have been improved.

Looking ahead, the biggest need is for thorough planning of the irrigation systems, since supplemental irrigation will probably become a prominent part of cotton production in the Delta area. There will be years when no additional water is needed, but records show that there will be more years with deficits than those with surplus water.—*Perrin H. Grissom, Agronomist, Delta Branch Experiment Station, Stoneville.*

• **Missouri** — Indications are that there will be considerable increase in 1955 cotton acreage under irrigation in Missouri. In 1954 there was an estimated total of 4,800 acres under irrigation, compared with about 400 acres in 1953.

County agents last year reported that 108 farmers used irrigation on their cotton acreage in the Boot Heel area. Survey results from about one-third of these farmers show that they watered from one to six times, applying an average of 4.6 inches of water during the season.

Most of the farmers reported yield increases, and the average increase credited to supplemental irrigation was 258 pounds of lint per acre.—*William J. Murphy, Field Crops Specialist, Missouri Extension Service, Columbia.*

• **New Mexico** — Production of cotton started in New Mexico in the early 19'0's along the Pecos River in Southern New Mexico and became of commercial importance in the Mesilla Valley, along the Rio Grande and in dryland areas of the eastern part of the state before World War I.

The great development of pump irrigation projects in the Lovington, Deming, Animas, Portales and Pecos Valley areas increased the acreage of cotton in New Mexico by 172 percent—from 116,000 harvested acres in 1945 to 315,000 harvested acres in 1953. Part of this expansion was due to ditch irrigation expansion, but in recent years of drouth, the runoff has been very low. Farmers have had to drill wells to supplement the river flow.

In 1953 at least 80 percent of the cotton acreage in New Mexico received some pump water and about 60 percent of the acreage depended entirely upon pump water.

Two of the greatest limitations to the future of cotton irrigation in New Mexico are limited underground water resources and the "salting up" of wells and land in many areas now under pump.—*Carl R. Hall, Assistant Agricultural Economist, New Mexico Experiment Station, State College.*

• **North Carolina** — Irrigated cotton in North Carolina in 1954 probably totaled about 50 acres. While the experiment station is not now doing any research in this field, supplemental irrigation of cotton in North Carolina has possibilities.—*C. H. M. van Bavel, Associate Professor, Department of Agronomy, University of North Carolina, Raleigh.*

• **Oklahoma** — For all practical purposes, total acreage under irrigation in Oklahoma in 1954 was approximately 155,000 acres. Of this acreage, a survey made by the Oklahoma Extension Service indicated that there were approximately 60,000 acres in cotton. In 1953 there were about 44,000 acres of irrigated cotton.

Irrigation in Oklahoma is supplemental to annual and seasonal rainfall. Indications are that there will be around 190,000 total acres under irrigation in 1955.—*H. F. Murphy, Head, Agronomy Department, Oklahoma A. & M. College, Stillwater.*

• **South Carolina** — In experiments at the South Carolina Experiment Station fully irrigated cotton in 1954 produced 1.6 bales per acre compared with .4 bale per acre where no irrigation was used. Experiments the preceding year showed gains of as high as 655 pounds of seed cotton per acre when water was applied. Exact figures were as follows: no irrigations, yield 1,560 pounds per acre; one irrigation, 1,860 pounds per acre; two applications, 2,150 pounds per acre.

Over a period of years experiments at the Station have showed an average increase of a little over a half bale per acre for irrigated cotton.

The practice is not yet widespread, but South Carolina will eventually be using more supplementary irrigation on cotton when such is needed. — *J. M. Eleazer, Information Specialist, South Carolina Extension Service, Clemson.*

• **Tennessee** — About one-tenth of Tennessee's 35,000 acres under irrigation in 1954 was in cotton. Indications are that interest in cotton irrigation is growing rapidly.

Most irrigation done in Tennessee in 1954 was by sprinklers, with some furrow irrigation being adopted in West Tennessee. Crops under irrigation included pastures, tobacco, corn, fruits, vegetables and hay crops.

While no experimental work has been done in Tennessee on cotton irrigation, it is hoped that some will be started in the future.—*E. B. Hale, Associate Extension Agricultural Engineer, Tennessee Extension Service, Knoxville.*

• **Texas**—Harvested cotton acreage irrigated in Texas in 1953 totaled 2,880,300

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acres, and while 1954 tabulations are not completed, it seems doubtful that total irrigated cotton acreage in Texas has changed materially in 1954. Of the 2.9 million acres irrigated in 1953, 2,623,200 were given supplemental irrigations and 257,100 were under complete irrigation. Total for all crops in Texas in 1953 was about 8.9 million acres; thus about one-third of the state's irrigation activity was devoted to cotton.

In 1954 irrigated cotton acreage increased in the Central and East Texas area, with most of the water coming from wells, and yields of irrigated cotton in this area ranged from one to over two bales per acre. Unirrigated cotton there produced from two-thirds to three-fourths bale in 1954.

In the Pecos-Fort Stockton and El Paso areas, water shortages prevailed in 1954. In the Lower Rio Grande Valley there was little change in the irrigated cotton picture, although water was more plentiful in 1954 than in 1953 and many farmers did a better job of irrigation last year.

In the High Plains area, no increase in total acreage under irrigation is estimated. In this area, the practice of pre-planting irrigations seems to be on the increase, and some farmers in the Pecos and El Paso areas are also adopting the practice.—*Roy C. Garrett, Associate Professor, Department of Agricultural Engineering, Texas A. & M. College, College Station.*

Arizona Growers Hold Meeting in Phoenix

Arizona Cotton Growers' Association is holding its annual meeting at Phoenix Feb. 15. Features scheduled include talks by Mitchell Landers, Berino, N.M., president of the SuPima Association of America, and Ed Lipscomb, Memphis, National Cotton Council. A panel on "How I Raised 3-Bale Cotton" is also planned.

Officers of the Association include J. Clyde Wilson, Buckeye, president; Cecil H. Collerette, Casa Grande, board chairman; J. D. Lee, Thatcher, first vice-president; Dan W. Clarke, Tucson, second vice-president; J. S. Francis, Glendale, third vice-president; Keith Walden, Tucson, secretary-treasurer; and E. S. McSweeny, Phoenix, executive secretary.

Research Leaders Confer

Cottonseed meal research progress and problems were discussed Jan. 24-25 at the New Orleans Southern Regional Research Laboratory. Attending the conference were research workers of USDA and state land grant colleges, members of the Laboratory staff and representatives from the Educational Service of the National Cottonseed Products Association.

Celebrate Anniversary

Mr. and Mrs. W. P. Lanier, Jr., Atlanta, who have many friends throughout the crushing industry, celebrated their twenty-fifth wedding anniversary last December. He is with Buckeye, has been president of the Georgia crushers' organization.

■ **BILL TOMME, formerly with Swift & Co. at Durant, Okla., now is at the firm's Brownwood plant.**

• Prison Gives Data On 1955 Sesame

MORE THAN 200,000 pounds of sesame seed were produced this season by the Texas Prison System, Byron W. Frierson, assistant general manager in charge of agriculture, reports.

Frierson estimates that yields averaged from 340 to 521 pounds of clean seed per acre on three different farms, but calls attention to the very great variations in yields within the different farms.

"Production ranged from an estimated 200 to 1,200 pounds per acre, depending on soil type, stand and planting dates. Soils ranged from sandy to clay types, and planting dates varied from March to June.

"The highest yield was that of a planting at Ramsey Farm made in May on sandy soil. This area was not harvested separately but, according to the yield of other plantings, yielded about 1,200 pounds.

"We have sold to date 150,000 pounds of these seed at prices of $12 and $12.05 per hundred, fob Sugarland, Texas, for commercial use and oilseed purposes only.

"We are neither selling planting seed nor advocating production of this crop by private farmers. We hand harvested the bulk of this crop, which would have cost heavily under other circumstances.

"Cleaning equipment is a necessity under present harvesting conditions with the K-10 variety of sesame, in order to prepare an acceptable product for market.

"Our experience was that it was very difficult under most conditions to get a good stand. A mellow, well-prepared seedbed seems essential.

"We are planning to increase our production of this crop in 1955, as it seems likely that with more knowledge of its proper culture we may fit it very well into our particular operation," he commented.

Observers have pointed out that the sesame grown by the Texas Prison System this season is not the nonshattering type which is the objective of plant breeders cooperating with National Cottonseed Products Association's research program.

Meeting Held by Public Relations Committee

Members of the public relations committee of Texas Cottonseed Crushers' Association met in Fort Worth Jan. 30, and later were hosts at the annual awards banquet for livestock judging teams at the Southwestern Exposition and Fat Stock Show.

Committee members at the meeting included Dixon White, Lubbock, chairman; George C. Quinn, vice-chairman, Austin; J. B. Crosslin, Coleman; Frank P. Dickson, Corsicana; Rufus W. Grisham, Memphis; F. D. Phillips, Sherman; W. C. Smith, Wichita Falls; and James R. Tindall, Twitty.

Other representatives from the industry present included R. P. Tull, Dallas, president, A. J. Mills, Stamford, vice-president, C. B. Spencer, agricultural director, and Jack Whetstone, secretary-treasurer of the Texas Association; Garlon A. Harper, Dallas, National Cottonseed Products Association; and T. J. Harrell, W. C. Painter, W. B. Vaughan, J. R. Edwards, Fred Davis, J. E. Adle and J. M. Tindall.

Dates Set for Releasing Allotments in Texas

The Texas ASC Committee has divided the state into five areas and set up closing dates for releasing and reapportioning unused cotton allotments. In Zone 1 release date is Feb. 21 and reapportionment date is Feb. 25. In Zone 2 March 28 and April 8. In Zone 3 April 18 and April 29. In Zone 4 May 9 and May 20, and in Zone 5 May 20 and June 3.

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Eriez representatives are located throughout the cotton belt. For free bulletin on Eriez magnets for ginning uses, write to Eriez Manufacturing Company, 78P Magnet Drive, Erie, Pa.

• Next Southwest Gin Schools in 1956

FEBRUARY, 1956, will be the time for the next schools for gin operators of the Southwest, at Dallas and Sherman. Representatives of gin machinery manufacturers, Texas and USDA Extension Service and Texas Cotton Ginners' Association met in Dallas Feb. 4 to discuss future plans for the school.

Schools in the future will be held every other year, starting in 1956, and the plan is to meet on a Monday and Tuesday in February, the exact date to be decided later. The schools will be held at the same time, in Dallas and Sherman.

Southwestern Cotton Gin Operators' Schools will be the title for the event in the future, and ginners' associations and extension services in other states of the Southwest will be invited to co-operate in securing maximum attendance of ginners from those states.

NCPA Board of Directors Will Meet in Memphis

Directors of National Cottonseed Products Association will meet in Memphis on Feb. 18, J. B. Snell, Minden, La., president, has announced.

Directors have designated John F. Moloney to serve as acting secretary-treasurer of the Association following the death of S. M. Harmon, which was reported in the Jan. 29 issue of The Press.

Association directors are James V. Kidd, Birmingham; Harry S. Baker, Fresno; James Hicky, Forrest City, Ark.; W. B. Coberly, Jr., Los Angeles; C. W. Hand, Pelham, Ga.; C. W. Wallace, West Monroe, La.; A. K. Shaifer, Clarksdale, Miss.; J. B. Perry, Jr., Grenada, Miss.; T. F. Bridgers, Wilson, N.C.; A. L. Durand, Chickasha, Okla.; E. H. Lawton, Hartsville, S.C.; F. B. Caldwell, Sr., Jackson, Tenn.; C. T. Prindeville, Chicago; E. A. Geoghegan, New Orleans; W. H. Knapp, Cincinnati; Dupuy Bateman, Jr., Houston; S. J. Vaughan, Jr., Hillsboro, Texas; and the following, also from Texas: Joe Flaig, Dallas; Henry Wunderlich, Corpus Christi; Roy Davis, Lubbock; and W. L. Goble, Sr., Waco.

Lower Valley Gin Sold To Davis Interests

Major Davis and his sons, Dan, Wayne and Wendell of Hillsboro, Texas, have bought Texas Gin Co. at Santa Rosa. They already owned a gin at Progreso in the Valley and a gin at Abbott.

J. E. Kirkland, Jr., also a member of the family, who operated the gin at Abbott, will be in charge of both Valley properties while Shelt Young will remain as local gin manager at Santa Rosa.

The six-stand gin was bought from Charles Bando, Dallas cotton man who also owns gins at San Benito in the Valley.

Group Buys Harlingen Gin

Douglas Carroll, retired Swift & Co. oil mill manager at Harlingen, Texas; Fred Reynolds, cotton broker; and Donald Kipp, cotton farmer, have incorporated as the Hub Gin Co. to take over the Hub gin from Lee B. Cramer.

Southeast Ginners Meet in Atlanta

Atlanta is the center of ginners' activities Feb. 14-15-16. In addition to the Southeast Gin Suppliers' Exhibit being presented for the first time, meetings are scheduled for four organizations—National Cotton Ginners' Association, Feb. 14, and on Feb. 15-16 the Alabama-Florida Cotton Ginners' Association, Carolinas Ginners' Association and Georgia Cotton Ginners' Association.

Tom Murray, Atlanta, is executive officer of the Alabama-Florida and Georgia groups, and Clifford Hardy, Bennettsville, S.C., is secretary of the Carolinas and National ginners.

A story on activities in Atlanta will be carried in the Feb. 26 issue of The Press.

• City Putting Gins Out of Business

DIRECTORS of Mesquite Cooperative Gin in Dallas County, Texas, have voted to meet March 12 to decide upon a proposal to liquidate the gin.

Cooperative representatives said that the action resulted from the rapid trend from farming to city development in the area. They pointed out that conversion of farms into homesites had influenced the closing of gins at Grand Prairie, Wilmer, Carrollton and Farmers Branch, all in the Dallas-Fort Worth area, since World War II.

Texas Insect Guide Now Available in Counties

Guide for Controlling Cotton Insects in Texas, 1955, has been published by Texas Extension Service.

Dr. J. C. Gaines, head, department of entomology, Texas A. & M. College, has announced that the publication may be obtained from county agents in all cotton growing counties.

Mrs. Judson Moses Dies Jan. 29 in Atlanta

Mrs. Judson Moses, wife of the Georgia Cottonseed Crushers' Association secretary, died unexpectedly Jan. 29 in Atlanta. Funeral services were held Jan. 31.

Besides her husband, Mrs. Moses is survived by a daughter, Mrs. Hugh C. Owen; a son, Judson E. Moses, Jr.; grandson, Garry Carter Owen; sisters, Arthreene Carter, Mary Carter, all of Atlanta; Benie Carter, Monroeville, Ala.; Mrs. C. J. Gridley, Orlando, Fla.; brothers, Harris P. Carter and Jesse R. Carter, of Monroeville, Ala.

Conservation Committee Meeting Date Changed

Feb. 28 will be the date for the water conservation committee of Texas Cottonseed Crushers' Association, which had previously been slated to meet on Feb. 14, Chairman J. H. Fox, Hearne, has announced. The date was changed because Governor Allan Shivers could not be present on that day.

The committee, in addition to the chairman, consists of R. A. Montgomery, vice-chairman, El Paso; C. L. Walker, Jr., vice-chairman, Temple; Don Guitar, Colorado City; R. R. Kelley, Stamford; John G. Kerlick, Yorktown; O. E. Key, Lubbock; Rex Steele, Harlingen; H. K. Eastwood, San Marcos.

Valley Ginners Elect Funk

The Lower Rio Grande Valley Ginners' Association has named Jack Funk, Lyford, president for 1955-56. Funk is manager of the Lyford Cooperative Gin. He succeeds Bryan Long, Electric Gin Co., San Benito. Shelton Young, Texas Gin Co., Santa Rosa, has been named secretary-treasurer of the group.

California Dealers To Meet

The California Hay, Grain & Feed Dealers Association will hold its annual meeting in San Francisco April 21-23, according to an announcement by R. A. Harelson, Northern Star Mills, Chico, president of the organization.

Moss-Gordin Holds Sales Meeting

SHOWN HERE are Moss-Gordin sales representatives from the cotton growing states and other company officials who attended the annual sales meeting held on Jan. 31-Feb. 1 at Lubbock.

• P. M. Jarvis Named Swift President

THE ELECTION of P. M. Jarvis as president and other changes in the top management of Swift & Co. have been announced in Chicago by the firm's board of directors.

Harold H. Swift who had served as chairman of the board since 1948 was elected honorary chairman and will continue as director and consultant to the board. John Holmes, president since 1937, succeeded Swift as board chairman, becoming the chief executive officer.

P. M. JARVIS

Two new vice-presidents were elected by the directors. They are E. D. Fletchall, who will assist President Jarvis and have managerial supervision of the company's meat packing plants, and Robert W. Reneker, who will direct activities in agricultural research, industrial relations and public relations, and also assist the president.

The new president had been executive vice-president since 1950. For several years he was vice-president in charge of Swift's oil mill and cotton gin operations. Jarvis started his company career in 1926 in the provision department of the South St. Joseph Meat Packing Plant. He came to Chicago in 1928 and in 1933 became an assistant to Holmes. He was elected vice-president in 1941 and a director in 1949.

His background of company service encompasses nearly all of Swift's varied activities, including supervision of meat packing plants, dairy and poultry operations, animal feeds, agricultural research, industrial relations, and public relations.

High hopes for the future were voiced by Jarvis, Swift's fifth president, as he assumed his new duties. "Swift is building for a greater future as it starts its second century of service," Jarvis said. "We want to keep pace with our growing nation and we are gearing our operations to achieve this goal with a program of continued plant modernization and added emphasis on research. More people need more and better food to meet the challenges that lie ahead. We are well equipped in man power and facilities to do the job of processing and distributing the products that Americans need." Jarvis also is active in various civic activities. He is a trustee of the University of Chicago, and a director of the Foundation for American Agriculture, the Farm Foundation and the Chicago Community Funds.

Accident Kills Oklahoma Banker, John Norris

John Norris, president of the First National Bank of Ada, Okla., was killed in an automobile accident on Jan. 30 near Durant. His daughter, Ruth Ann, suffered cuts and bruises and another passenger, Nina Merentes, was injured. Highway officers said that another car pulled directly in front of the Norris car.

He and members of his family have many friends in the crushing industry who extend sympathy.

Superintendents Meet

Superintendents of the Little Rock area, members of Tri-States Oil Mill Superintendents' Association, heard a number of industry problems discussed at a regional meeting on Feb. 12. E. F. Kelley, Buckeye Cotton Oil Co., Little Rock, was program chairman.

Early Reservations Urged

Persons planning on attending the Western Cotton Production Conference, March 8-9 at Hotel Westward Ho, Phoenix, should make hotel reservations early. Mitchell Landers, conference chairman and president of Southwest Five-States Cotton Growers' Association, says space will be scarce at that time of year.

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Oil Mill Equipment for Sale

FOR SALE — Filter presses; screening tanks; single and twin motor Anderson Super Duo expellers, with conditioners; several extra 36" cooker dryers and conditioners. All steel linter baling presses; 141-176 saw linters; seed cleaners; No. 153 separating units; bar hullers; lint beaters; stack cookers; rolls; hydraulic press room equipment.—V. A. Lessor & Co., P. O. Box 108, Fort Worth, Texas.

OIL MILL EQUIPMENT FOR SALE—Complete solvent plants, rebuilt twin motor Anderson high speed expellers, French screw presses, stack cookers, meal coolers, filter presses, oil screening tanks, complete modern prepressing or single press expeller mills.—Pittock and Associates, Glen Riddle, Pa.

FOR SALE—Rebuilt, cleaned and painted expellers, screw presses. New and rebuilt parts. Oil mill equipment, all kinds. Installation and trouble shooting service.—Carter Foster, Jr., P. O. Box 522, Temple, Texas. Phone 3-4890, warehouse 502 North 14th Street, Temple, Texas.

FOR SALE—One 141-saw iron frame delinter with ball bearings-saws and brush, permanent magnet, steel chute and condenser with feeder. One French 4 High 85" Cooker with all side walls steam jacketed and 40 inches deep outside rings. One 200 H.P. General Motors diesel engine; also, one 60 H.P. same engine. One 3 High 72" French Cooker. One set 48" 5 High Rolls.—Phone 2-5901 or write J. E. Lipscomb, Box 716, Greenville, S.C.

FOR SALE—Anderson Super Duo expellers, each complete with 14" conditioner and 36" cooker; rolls, cookers, 176 and 141-saw Carver linters, all completely rebuilt. Butters milling machine. Double box linter press. Filter presses, attrition mills. 54" and 60" seed cleaners, No. 153 separating unit, No. 136 double drum hull beater.—Sproles & Cook Machinery Co., 151 Leslie St., Telephone PR-5958, Dallas, Texas.

Gin Equipment for Sale

FOR SALE—We have two 4-80 Murray Gins modern in every respect with the exception of lint cleaners. Excellent locations. Within a five mile radius of Blytheville, Arkansas. One all metal building, easily moved. The other is a concrete building. Box "EE", c/o The Cotton Gin And Oil Mill Press, P. O. Box 7985, Dallas, Texas.

Electric Motors

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FOSHEE ELECTRIC CO.
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FT. WORTH, TEXAS

FOR SALE—One 8-cylinder Murray incline cleaner 70". One 6-cylinder Murray incline 52". One 6-cylinder horizontal 52". One 6-cylinder Murray blow in horizontal 52". One 4-cylinder Lummus horizontal 96". One 6-cylinder Continental cleaner, three horizontal three incline 10'. One 70" Continental dropper. One 70" Murray V.S. dropper. Four 60" Standard Mitchells. Four 60" Super Mitchells. Four 66 Super Mitchells. Four 66 Standard Mitchells. Packers: Murray, Continental, E. J. Cameron. Two all steel late model Continental bur machines. One 14' wood frame Hardwicke-Etter bur machine. Two pair Fairbanks Morse seed scales. Four 80-saw model C brush and four model C air blast gin stands D.C. Some extra late model glass front Murray gin stands. Pumps, Murray and Lummus, Goverment type tower driers. 1- and 2-million Mitchell burners, seed sterlizers all sizes. Other items, too many to list. Let us know your needs. We guarantee our equipment for the first season.—Spencer & Sons Cotton Gin Service, 5 miles North on Dallas Highway 81, Georgetown, Texas.

FOR SALE—Four Head Linter Saw Filing Machine, electric drive, 106-141 saw, new.—P. O. Drawer 659, Ballinger, Texas.

FOR SALE—5-70 saw Lummus gin stands, extractors, feeders, distributor, condensor, seed scales. 5-cylinder air line cleaner. 50" steel separator. Thermo Dryer, bucket elevators, 6" and 9" conveyor, press, ram and casing.—Geo. T. Jepsen, Prague, Oklahoma.

FOR SALE—Automatic Gas Furnace—Two heat stages, prevents overheating of cotton. Write for free literature.—Faucher Control Co., P. O. Box 166, Arlington, Texas.

FOR SALE—1-50" Murray Big Reel Dryer. One 6-cylinder all metal 50" cleaner.—Anton Producers Co-op Gin, Anton, Texas.

FOR SALE—Gins: 4-80 DC Continental F-1 brush; 4-80 DC Continental C-brush; 5-70 Continental C-brush with 30 fronts; 5-80 DC glass front Murrays; 5-80 DC Hardwicke-Etter; one 80-saw DC Hardwicke-Etter; 3-80 DC Lummus double moting. Lint cleaners: 5-80 Hardwicke-Etter; 5-80 Murray. Huller-cleaner-feeders: 5-66" V-drive special Super Mitchells; 5-66" V-drive cast iron head Super Mitchells; 4-66" standard flat belt Mitchells; 1-60" V-drive special Super Mitchell; 1-66" flat belt drive Super Mitchell; 5-66" double V-drive Hardwicke-Etter with 4-cylinder after cleaner. Good as new—looks new, 4-80 Lummus L.E.F. Cleaners: one 9-cylinder and one 5-cylinder 50" Hardwicke-Etter steel; two 52" Continental inclined steel; 1-10 and 1-15 section Lummus thermos. Bur machines: one 14' right hand Hardwicke-Etter steel; one 10' Lummus steel. Condensers: 1-60" and 1-70" 1949 Lummus steel; 1-60" Continental model 40 steel. Burners: 1 Hardwicke-Etter; 1 Mitchell. Presses: one Lummus steel-bound swing door; one Cen-Tennial steel-bound. Dryers: One Murray big reel; two Lummus thermos. Separators: One 1952 Gullett; one 1950 Continental. Trampers: One Lummus; one Cameron. Engines: One MM 210 h.p. twin; one MM 240 h.p.; one FBM 120 h.p. full diesel; one GM twin diesel.—Bill Smith, Box 694, Phones 47847 and 49626, Abilene, Texas.

FOR SALE—One complete 3-80 Gullett all steel gin plant, with Continental lint cleaners, all steel uppacking press, 14' Burr machine, 6-cylinder incline cleaner, 12 shelf Tower dryer with 2 M B.T.U. Burner, 220 H.P. GM diesel engine, iron clad building for $35,000.—C. H. Reddig, Holly Grove, Arkansas.

FOR SALE—Good as new Murray five eighty lint flue—main trunk and short flues.—Traylor Gin Co., La Feria, Texas.

FOR SALE—4-80 saw late model glass front roll dump Murray Gin Stands with lint flue and new extra saw cylinder.—Planters Coop Gin, Chicota, Texas.

FOR SALE—3-80 saw Hardwicke Etter gins with couplings, lint flue. Also, 3-66" large type Hardwicke Etter feeders. Price $3,000. — Murray Hambleton, Forrest City Gin Company, Forrest City, Ark.

FOR SALE—Four 1941 Model, 53" Mitchell convertible machines V-belt drive, excellent condition.—Muskogee Cotton Oil Mill, Box 1567, Muskogee, Okla.

FOR SALE—One E. J. tramper; one Continental 4-drum incline cleaner and vacuum separator; one set lint flues and connections for late model 4-gin Continental outfit; one 75 H.P. Westinghouse motor, 2200 volt, 900 RPM.—Smith Gin Company, Cartersville, Georgia.

FOR SALE—5-80 Murray all-steel gin on irrigated part of South Plains, $55,000.—Box "AN", c/o The Cotton Gin and Oil Mill Press, P. O. Box 7985, Dallas, Texas.

FOR SALE—4-80 saw single moting air-blast gins. These gins are in good shape and ready for service. About 1939 model.—Farmers Gin, Sentinel, Oklahoma.

FOR SALE—Murray type Cotton Gin, 4-80 saw stands. Atterbury Sterilizer driven with 5 h.p. electric motor. Main Gin powered by Fairbanks Morse engine. 100 ton seed house and new mixed feed warehouse built two years ago.—For information please write P. O. Box 191, or phone 5-6815, Navasota, Texas.

FOR SALE—Cotton Gins, Oil Mills and Compresses. Some for operation where located, others for sale to move.—If interested contact M. M. Phillips, Phone 5-8555, P. O. Box 1288, Corpus Christi, Texas.

GINNERS—When in need of machinery or power or when you have machinery for sale or trade, call us first. We have many items of new and reconditioned equipment in stock, ready for prompt shipment.—R. B. Strickland & Co., 13-A Hackberry St., Telephones: Day 2-8141, Night 3-7929, Waco, Texas.

FOR SALE—Four Super Mitchell Extractors, run 5 seasons; one Murray double auger distributor for 4-80 gin; one 1000 gallon Butane gas tank; one #30 Mitchell vaporizer; one Regulator.—Southern Cotton Oil Company, Macon, Georgia.

FOR SALE—4-90 saw Hardwicke-Etter Gin Stands with hot roll box and new type moting. 4 Hardwicke-Etter Master Extractor Feeders, newest models. 1-14' Hardwicke-Etter all steel Big Bur machine with supports and all platform. One 7-cylinder Hardwicke-Etter all steel 50" inclined cleaner with supports and vacuum dropper. One 7-cylinder all steel Murray inclined cleaner with supports and vacuum dropper. 4-saw type Murray lint cleaners complete with fans and piping.—Call or write Sam Clements & Co., Tele. 2010, Greenwood, Miss.

FOR SALE—One 4-cylinder 72" Hinckley neverchoke cleaner and dryer. One steel platform. One double 30" fan. All three years old. Priced to move. — Darby's Gin, Arnaudville, Louisiana, Phone: 2311.

FOR SALE—4-80 saw Lummus gin stand, double moting, DC-AB with lint flue. Four 60" L. E. F. Lummus feeders. One H-E seed scale. One Lummus horizontal press pump. One 160 h.p. Twin City gas engine. 4-80 saw Murray gin stand, 6" mote conveyor. One 14' H-E bur machine, wood, left hand. One Murray steel bound cotton press with ram and casing. 5-80 saw H-E gin stands with hot roll box and vacuum moting. See our stock fans, pulleys, bucket elevators. We are distributors for steam and dry heat seed sterilizers, screw elevators, conveyor and power transmission equipment.—Strader-Hughston Company (formerly Hughston Sales Company), Phone FO8-5883, Rt. 7, Coit Road, Dallas, Texas.

FOR SALE—2 Single Head Creasy Rotary Electric Gin Saw Filing Machines. Slightly used, factory reconditioned, priced to sell.—Creasy Rotary Filer Co., Ballinger, Texas.

FOR SALE—5-80 Continental lint flue, good condition, rectangular connections to stands. Write Pecos Valley Cotton Oil Company, Loving, N.M.

Equipment Wanted

WANTED—One 3-cylinder incline after cleaner either 10 or 12 ft.—Anton Producers Co-op Gin, Anton, Texas.

WANTED—Power units for gasoline or natural gas. Give description and price.—Jack W. Miller, P. O. Box 133, Dimmitt, Texas.

WANTED TO BUY—Gin between Dallas and Paris, Texas. Must be good, well established, up and going concern. (A cash transaction).—Box "FA", care The Cotton Gin and Oil Mill Press, P. O. Box 7985, Dallas, Texas.

WANTED TO BUY—All steel gin building that can be moved in sections. Please state price.—H. E. Lacey, Lufkin, Texas.

WANTED—5 late model feeder extractors to fit 80 saw gins. Give time used, price at location.—P. O. Box 265, Runge, Texas.

WANTED—A good used late model Carver Tru-Line Gummer for handling 141 saw cylinders. Reply giving condition, price and location.—Box "XL" c/o Cotton Gin & Oil Mill Press, P. O. Box 7985, Dallas, Texas.

WANTED—3 or 4 Continental lint cleaners, 1951 model or above. Must have lint flue above ground. —Grover J. King, P. O. Box 55, Swansea, South Carolina.

Personnel Ads

WANTED—Bookkeeper with oil mill experience, very dependable, and willing to work.—Write P. O. Box 1989, Harlingen, Texas.

Power Units and Miscellaneous

FOR THE LARGEST STOCK of good, clean used gas or diesel engines in Texas, always see Stewart & Stevenson Services first. Contact your nearest branch.

FOR SALE—New and rebuilt Minneapolis-Moline engines, from 35 h.p. to 220 h.p., call us day or night for parts and service.—Fort Worth Machinery Co., 913 E. Berry St., Fort Worth, Texas.

FOR SALE—Bearings, electric motors, chains, sprockets, V-belts, sheaves, flat belting, pulleys, conveyors, elevators, Lubriplate products.—Allen Transmission and Supply Company, 2300 Good-Latimer, P. O. Box 7912, Dallas 26, Texas. Phone: HU-5321.

FOR SALE—8-cylinder Le Roi engine.—W. C. High Gin, Hale Center, Texas.

FOR SALE—Le Roi RXI, (D-1000) 79-138 H.P., 1002 cubic inch displacement, 4-cylinder, 6¾ x 7 bore and stroke. Complete with heat exchanger, $1350. Le Roi RXIS, (F-1500) 118-208 H.P., 1503 cubic inch displacement, 6-cylinder, 6¾ x 7 bore and stroke, complete with heat exchanger, $2750. Le Roi RXIV, (H-2000) 158-280 H.P., 2004 cubic inch displacement, V-8 cylinder, 6¾ x 7 bore and stroke. Complete with heat exchanger, $3750. Climax V-80, 165-240 H.P., 2155 cubic inch displacement, V-8 cylinder, 7 x 7 bore and stroke, $4500.—Wonder State Manufacturing Company Power Units, P. O. Box 461, Telephone 2-7754 Cedar, Paragould, Arkansas.

FOR SALE—One 6000 gallon propane tank and one No. 7 Mitchell vaporizer. Phone or write—Dixie Gin Company, P. O. Box 55, Trumann, Ark., or phone 338.

FOR SALE—120 h.p. Tips engine in good condition. Bargain.—Eddie Witte, P. O. Box 184, Giddings, Texas. Phone: 22.

New British Machine Will Aid Fiber Measuring

Britain's Wool Industries Research Association announces the development of a machine capable of measuring single fibers up to 30 cms in length at a rate of up to 500 an hour. It automatically classifies the fibers into 0.5 cm groups, and semi-automatically records their length. The machine is expected to simplify greatly the work of research workers and textile industry staffs.

More Energy Used in 1954, But Less Water Pumped

Arizona farmers used about four percent more energy for irrigation pumping in 1954 than in 1953, but they pumped about five percent less water because of the greater lift, according to Arizona Experiment Station.

The 1954 consumption of energy for lifting water from ground water sources was 1.3 billion kwh of electricity and six billion cubic feet of natural gas at atmospheric pressure.

Total water available for irrigation amounted to nearly six million acre-feet of which two million were diverted from streams and storage dams measured at the point of diversion and about four million were pumped.

This was about the same amount of water as that used in 1953, but it was used on fewer acres partly because of concentration of water on the smaller cotton acreages and partly because of double cropping of grains. Of the gravity water available for irrigation, the Colorado River contributed about 900,000 acre-feet; the Salt River system 805,000; and the Gila River above the Salt, 220,000.

Letter Urges Release Of Cotton Acreage

Texas Cottonseed Crushers' Association has sent a letter to state, district and county ASC offices in Texas urging the release as soon as possible of cotton acreage allotments to farmers who wish to plant. Association members also are being urged to follow up to see that unplanted acreage is held to a minimum.

Care of Pumps Advised

Irrigation pumps that decrease in flow or show air in the flow during heavy pumping need attention, says J. E. Middleton, Arizona Extension irrigation specialist. It may be necessary to lower the bowls to reach the water table or the well may require deepening. Middleton suggests a call on the pump repair man to determine what needs to be done before any action is taken.

Mississippi Ginners Discuss Problems

MISSISSIPPI'S ginner delegates to the 1955 National Cotton Council meeting, held at Houston, included George E. Bird, left, from Inverness and Cecil Frazier from New Albany, seen talking over ginning problems.

New Book

WELLINGTON SEARS ISSUES FILTER FABRICS DATA

Wellington Sears Co., producer of industrial fabrics, has announced the publication of a 16-page illustrated booklet on filter fabrics, "Filter Fabric Facts." While the booklet makes no claim to being a complete technical manual, it summarizes a number of general and specific facts about this specialized subject which are not believed to have been generally available to the processing industries in any one publication before.

Based on Wellington Sears' fabric development files and the experience of specialists in various aspects of filtration, this booklet contains information about filtration principles; filtering devices, filter media; textile fibers for filtration; a comprehensive chart on chemical and heat resistance of cotton and synthetic fabrics; sections on yarns, fabric construction and finishing; and a round-up of filter fabrics in use. Among the illustrations are photographs of a few examples of the variety of filter fabrics being produced for industrial customers by the mills of West Point Manufacturing Co., Wellington Sears' parent organization.

Willfred W. Lufkin, Jr., president of Wellington Sears, announced that the booklet will be distributed among present and potential users of filter fabrics. Copies for reference libraries may be obtained without charge from Wellington Sears Co., 65 Worth Street, New York; or from The Cotton Gin and Oil Mill Press, P. O. Box 7985, Dallas 26.

Feed Output Sets Record Of 85 Million Tons

The nation's feed manufacturing industry chalked up a new all-time production record in 1954, according to W. E. Glennon, president, American Feed Manufacturers Association. On the basis of statistical tabulations of the Association, total output for the industry was placed at 35 million tons, an increase of four percent compared to a year earlier.

Of the various feed types, swine feeds showed a 23 percent increase; beef feeds were up 13 percent; turkey feeds were up nine percent; and, commercial broiler feed tonnage increased three percent. Dairy feeds were off eight percent, the only feed type to show a reversal of the general trend.

Of the total tonnage of feed manufactured, 61.5 percent was poultry feed of all types; 18.4 percent was dairy feed; 10.2 percent was swine feed; 5.3 percent was beef and sheep feed; and 4.6 percent was classed as miscellaneous. Of the poultry feed tonnage, 27.5 percent was commercial broiler feed, and 8.5 percent was turkey feed.

Manufactured feed production, with percentage increases shown parenthetically, was listed as follows: 1954 35.0 million tons (104 percent); 1953 33.7 million tons (98 percent); 1952 34.4 million tons (105 percent); 1951 32.8 million tons (113 percent); 1950 29.1 million tons (102 percent); 1949 28.5 million tons (112 percent).

Irrigation Meeting Set

An irrigation conference will be held Feb. 24-25 at Texas A. & M. College, sponsored by the agricultural engineering department.

Cotton Council

(Continued from Page 29)

Worth, vice-president; L. T. Barringer, Memphis, vice-president; H. L. Wingate, Macon, Ga., vice-president; Aubrey L. Lockett, Vernon, Texas, treasurer; and Wm. Rhea Blake, Memphis, executive vice-president and secretary.

Advisors to the board are Robert L. Coker, Hartsville, S.C.; Lamar Fleming, Jr., Houston; and Harold A. Young, North Little Rock, Ark.

Program committee chairmen who are ex officio board members include Tom J. Hitch, Columbia, Tenn., utilization research; A. E. Hohenberg, Memphis, foreign trade; Cecil H. Collerette, Casa Grande, Ariz., production and marketing; J. Craig Smith, Sylacauga, Ala., sales promotion; and A. L. Story, Charleston, Mo., domestic trade barriers.

• **Directors Named**—The following were elected directors for 1955:

Producers: J. H. Henry, Melrose, La.; Walter L. Randolph, Montgomery, Ala.; Delmar Roberts, Anthony, N.M.; Boswell Stevens, Macon, Miss.; and A. L. Story, Charleston, Mo.

Ginners: Harry Baker, Fresno, Calif.; James S. Francis, Peoria, Ariz.; Garner Lester, Jackson, Miss.; J. F. McLaurin, Bennettsville, S.C.; and A. G. Swint, Orchard Hill, Ga.

Warehousemen: B. L. Anderson, Fort Worth; Thomas N. Durst, Columbia, S.C.; B. L. Mallory, Jr., Memphis; Charles F. Manly, West Memphis, Ark.; and Harris T. Underwood, Lubbock.

Merchants: J. L. Hurschler, Pasadena, Calif.; Burris C. Jackson, Hillsboro, Texas; A. G. Paxton, Greenville, Miss.; C. D. Tuller, Atlanta; and S. Y. West, Memphis.

Crushers: G. E. Covington, Magnolia, Miss.; O. L. Frost, Bakersfield, Calif.; R. M. Hughes, Greer, S.C.; L. T. Lewis, Roswell, N.M.; and L. M. Upchurch, Raeford, N.C.

Spinners: A. B. Emmert, Danville, Va.; Charles C. Hertwig, Macon, Ga.; J. Craig Smith, Sylacauga, Ala.; Fred W. Symmes, Greenville, S.C.; and A. K. Winget, Albemarle, N.C.

• **Monday Session**—The initial general session opened Monday with the invocation by the Reverend Thomas W. Sumners, which was followed by the welcome address of Houston's Mayor Roy Hofheinz, and the address of President Durand, mentioned previously.

The president's address was followed by the address by one of the two national agricultural leaders who were guest speakers at the meeting.

• **Address by Benson** — Secretary of Agriculture Ezra Taft Benson, guest speaker for the opening session Monday, emphasized that the theme which has dominated his administration—research and education, rather than limited production and high supports—is the key to a prosperous agriculture.

He called attention to the $20 million increase in research and education funds for this year and the request for a further increase of about $14 million for fiscal 1956.

Secretary Benson cited the self-help program of SuPima producers (which has been discussed previously in The Press) as an example of doing something to solve agricultural problems. "If other serious and basic problems of agriculture are attacked with concentrated research, backed by a united and resolute industry anxious to work out its own problems, this success story can be repeated," he said.

"Markets will be won by those who fight for them. Research to improve products and lower costs, plus aggressive sales promotion, remain the tools with which to do this job."

USDA's chief reviewed some of the gains that cotton has made in efficiency and economy of production and praised the united efforts of the industry through the Council.

He discussed current marketing problems, forecast 20 percent increase in cotton exports and expressed optimism over the longtime outlook.

Departing from his prepared text at the end, the Secretary made an earnest expression of the ideals which guide his work.

• **Program Outlined**—Reports by Wynn, as chairman of the operating policy committee, and Executive Vice-President Wm. Rhea Blake opened the effective presentation of facts developed through the year-long study conducted by the Council staff.

Staff members then presented detailed discussions of what has been done in behalf of cotton since 1939, where cotton stands today and where cotton has an opportunity to go in the future, provided that the industry invests in adequate programs.

Each matter presented at the general session had been reviewed earlier by staff members, directors, and special committees and was specifically authorized to be placed before the group as a whole for the industry's decision.

• **Tuesday Session**—Committee reports opened the Tuesday morning session as 1955 plans were discussed by the chairmen of committees on foreign trade, production and marketing, utilization research, sales promotion, domestic trade barriers and public relations.

Committees recommended a number of specific activities in their fields, and the resolutions governing these matters were adopted at the final business session.

Other reports Tuesday included those of the Oscar Johnston Foundation, which, among other activities, now is building a memorial building which will house the Memphis Council offices; and reports of the Washington representative, treasurer and nominating committee.

• **Shuman Speech**—Monopoly pricing in business, labor, agriculture and government was condemned by the second day's guest speaker, Charles B. Shuman, president, American Farm Bureau Federation.

He advocated strong efforts to expand foreign markets for cotton as well as to increase domestic cotton consumption, adding, "We must be willing to facilitate the imports which are necessary to pay for our exports."

Shuman listed the four essentials for a prosperous agriculture as: an adequate volume of foreign trade, competitive pricing in all segments of the economy, efficiency of the individual farmer, and a healthy national economy.

He expressed concern over reports that the administration has called in a former OPA administrator to draft blueprints for standby price and wage controls for use in a national emergency. "Price and wage controls proved a failure in war and peace," he said.

• **Directors Meet**—A meeting of the new board of directors for 1955 was held on Tuesday afternoon immediately following the adjournment of the general session.

• **Houston Hospitality**—Members of the industry in Houston were hosts at a reception in honor of the Council in the Emerald Room on Jan. 31.

The annual dinner and dance also were held at the Shamrock on the evening of Feb. 1.

Many other private parties were held and other entertainment provided among the special groups attending the meeting.

Chairmen of special committees responsible for the success of the various official functions included: S. M. McAshan, Jr., Anderson, Clayton & Co., and president of the Houston Cotton Exchange, chairman, general arrangements; and Nathan Rosenfield, Weil Brothers Cotton, Inc., Houston, chairman of the welcoming committee. The men's hospitality committee was headed by R. O. Beach, Jr., George H. McFadden & Brother, Houston, and Dupuy Bateman, Jr., Anderson, Clayton & Co., Houston.

Other committees and their chairmen included: ladies' hospitality—Mrs. R. O. Beach, Jr., and Mrs. S. M. McAshan, Jr., co-chairmen; and ladies' transportation —Mrs. Dupuy Bateman and Mrs. D. E. Japhet, co-chairmen.

Work of Council Staff Praised

National Cotton Council staff members currently are receiving high praise from cotton industry leaders for an outstanding job during the past year. This has been the thorough analysis made of past performances by the Council since 1939 and the evaluation of opportunities for future work in behalf of cotton and cottonseed.

Charged with the responsibility of making this detailed study by action taken at the 1954 annual meeting in Atlanta and subsequent action by the board of directors, Council staff members have worked many nights and week ends to compile the needed information—in addition to carrying on the usual effective Council program. As a result of this tireless work, the cotton industry now has a complete picture of what one speaker at the Houston meeting described as "where we've been, where we are today and where we have an opportunity to go in the future."

T. C. Lees Have New Son

Mr. and Mrs. T. C. Lee, Memphis, have announced the arrival of their sixth child, Michael Edgar. Father is with Perkins Oil Co. and a past president of National Cottonseed Products Association.

Plant Sets Safety Record

Swift & Co. refinery at Memphis has received a plaque for completing 3,609 man-workdays without a lost time accident.

Cotton growers are more and more interested in this important and relatively new phase of production. Here is information every grower should have about latest work on chemicals.

Defoliants and Desiccants

By WAYNE C. HALL

WITH INCREASING emphasis being placed on the necessity of lowering production costs, all phases of cotton culture from planting to harvest have become geared to complete mechanization. As a key part of mechanical harvesting by either the stripper or spindle-type picker, as well as of efficient hand harvesting, there has been a general acceptance and wide-spread use of pre-harvest chemicals over the entire Cotton Belt.

Predictions are that the usage of defoliants and desiccants will continue to increase through 1955 and the immediate years ahead. They have already become an essential part of not only a successful picking or stripping operation before frost, but they are also rapidly assuming a supporting role of importance in weed and insect control practices and other aspects of the total production picture.

Considerable progress already has been achieved in understanding the factors that regulate success or failure in cotton defoliation and desiccation. Some of these that are known are: characteristics of the chemicals and optimum rates and volumes; best methods of application; the role of climatic and cultural factors, particularly moisture, temperature, fertilization and plant density; and varietal responses. Much information on these subjects has already been made available to the cotton grower through the combined efforts of state experiment station and extension workers, federal and commercial personnel.

Further progress is mandatory in developing more effective and reliable defoliating, desiccating, and growth inhibiting chemicals to the end that a wide spectrum of compounds be made available for specific purposes and, in formulating better guides under highly specific localized conditions. At the same time educational programs must be improved for disseminating current research findings to the grower who puts them into practice, not two to three years hence but at the time that he needs them.

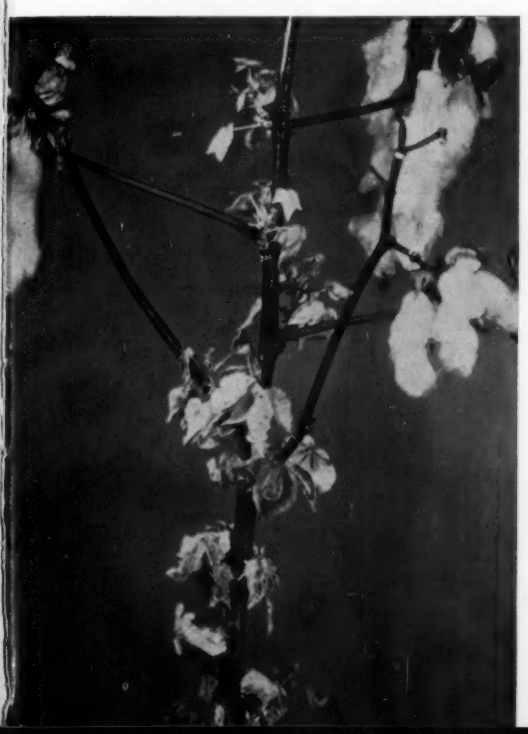
Currently, cotton growers are logically expecting research workers to answer a number of pointed questions: (1) What new experimental or commercially-available chemicals are most effective in defoliating or desiccating cotton and in the prevention of regrowth? (2) What advances have been made in agronomic pre-harvest practices? (3) Should defoliants or desiccants be used and does their use actually pay? (4) Will pre-harvest chemicals have detrimental effects on fiber or seed properties or upon livestock or man?

This report will attempt to answer briefly these questions by summarizing the advances made in 1954. The discussion will be based primarily upon Texas results and conditions, but within the knowledge of the author references to results obtained in other states will be made when applicable.

• **Performance of Compounds** — Of the currently newer experimental compounds, amino triazole or Amizol continues to hold the limelight of interest as one of the most promising defoliants and regrowth inhibitors tested to date. It is highly water soluble, non-corrosive to application machinery, and relatively non-toxic to man or animals. In extensive field testing across the Belt, amino triazole has been found to be an effective defoliant when applied at the rate of one to two pounds per acre. In Texas, at these rates, it has given as good or better defoliation than any other materials applied in both small plot or large scale field tests conducted from the Lower Rio Grande Valley to the High Plains. Climatic and cultural conditions varied widely in the tests. At Weslaco, in the Lower Rio Grande Valley, the irrigated cotton was rank and badly lodged from hurricane damage, whereas dryland cotton at Temple in the Blacklands was small, and severely drouth stressed. As an intermediate there were moderate sized plants grown both under slightly drouthy conditions and under supplemental irrigation at College Station and in the Brazos River Valley area. At Port Lavaca, in dryland tests, cotton was uniform but about two weeks past the peak for optimum defoliation; at Lubbock, the material was applied to late irrigated stormproof cotton. In addition, ground and aerial applications of amino triazole were made to both early and late cotton at College Station.

These results amply demonstrated the effectiveness of amino triazole in reducing second growth for two to five weeks following application under the widely varying conditions mentioned above. Amino triazole at lower concentrations was mixed with and found to be compatible with all of the various types of water soluble commercial defoliants. It increased the effectiveness of other defoliants and in addition suppressed regrowth. Particularly outstanding were the results obtained with sodium ethyl xanthate (SEX), magnesium chlorates, soluble cyanamide, and NP-1098 in combination with amino triazole. New growth produced following amino triazole application is characterized by varying degrees of chlorosis or albinoism. This reduces the hazard of chlorophyll staining. At present production prices, the use of amino triazole as an additive and regrowth inhibitor may prove to be its most practical application. Preliminary tests, however, with various salts and derivatives of amino triazole show exceptional promise of increased effectiveness at much lower rates than straight amino triazole (ATA). Reduced rates of application should enhance the economic feasibility of the amino triazole family of compounds for commercial use.

Other results with amino triazole, both alone and as an additive with other defoliants, in tests in Arizona, the Mississippi Delta and the Southeast are in



At left is a close-up of a cotton plant five weeks after defoliation with amino triazole. Note small regrowth confined to central stalk. WAYNE C. HALL is Physiologist at Texas A. & M. College and Texas Experiment Station, College Station.

general agreement with the Texas results. Workers from these other states have also reported effective control of second growth under conditons conducive for heavy regrowth and in some cases an increased speed of leaf fall when amino triazole was used.

Two other experimental defoliants tested in 1953 continued to look promising in 1954. Results with NP-1098, particularly in the Southeast and when applied in combination with amino triazole, are encouraging. NP-1098 was found to be effective in Texas only in combination with amino triazole. The second defoliant, Phillips 713D, has again proved satisfactory in the stripper areas of Texas and Oklahoma as well as elsewhere. It has considerable potential both as a defoliant and desiccant and several experimental combinations of 713 with certain oil soluble additives have increased leaf drop and retardation of regrowth this season.

The 1954 tests with the "old guard" defoliants can be summarized briefly, as follows:

Calcium cyanamide dust and the chlorates or chlorate-borate sprays had more extensive use over the Cotton Belt and turned in more consistent performance than any of the other commercially available compounds.

Calcium cyanamide gave excellent defoliation when the proper conditions of plant and dew were present. However, when these optimum conditions existed for defoliation, regrowth was also profuse.

Soluble sodium cyanamide gave erratic results; in same tests it was the best defoliant; in others the poorest. This compound has been withdrawn from the market and will not be available in 1955.

Several new formulations of magnesium chlorate appeared this season, Magron and E-Z-Off defoliants being representatives of the liquid concentrates. De-fol-ate was still available as a water soluble powder.

The chlorates and chlorate-borates in general have given good results with some variability noted among brands. The magnesium chlorates have proven especially effective in combination with amino triazole.

As was true in 1953, sodium ethyl xanthate (SEX) was not as adaptable to varying conditions and gave good performance only in localized areas. The SEX-amino triazole combination is also worthy of mention; amino triazole increased both the effectiveness and the consistency of results.

Endothal still gave excellent results in certain areas of Texas, but its performance in the Mississippi Delta and in certain parts of the Southeast has not compared favorably with that of other defoliants.

Pentachlorophenol formulations in oil still dominated the desiccation field under conditions where thorough, rapid drying and killing of the foliage was desired. With the exception of the chlorophenoxy compounds, tests were discouraging where oil soluble inhibitors were added to pentaoil combinations to suppress regrowth. However, due to the severe drouth and poor crop in the Blacklands of Texas this season, regrowth was not the critical problem of previous seasons. Preliminary tests indicated that when cotton was sufficiently mature, with 90 percent or more of the bolls open, there was little evidence that chlorophenoxy materials (2,4-D-like) were carried over in the seed. Extreme caution still should be exercised in the use of these materials when they are employed to accelerate drying and to check second growth. Their use is recommended only under conditions where the need of preventing regrowth outweighs the possible hazards of using 2,4-D-like compounds in cotton.

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• **Advances in Preharvest Practices**— Although no revolutionary changes have taken place during 1954, considerable progress and improvement in application machinery and methods have been achieved. Ground sprayers particularly have been improved. More efficient high-clearance sprayers, better shielded to prevent damage to cotton, have appeared on the market. High pressure ground sprayers, operating on a custom basis, have resulted in more efficient and economical defoliation, particularly in California and where the open-boll cottons are grown under irrigation in Texas. Extremely good results have been obtained with a single flooding-type nozzle mounted directly over the row by the Stoneville, Miss., workers. This type of arrangement should be thoroughly tested in other areas where it might have application. Aerial applicators are doing a better job of timing applications, covering thoroughly, and in selecting the proper chemical for seasonal or local variations in the crop.

The bottom defoliation practice, in high yielding areas where boll rots are prevalent, still proves to be an effective technique. Arizona workers' progress in this has been outstanding. Better education in selling growers on benefits of this practice in these areas is needed.

The use of pre-harvest chemicals in predominantly hand-harvest areas to obtain uniformity of opening and to increase picking efficiency of hands in rank tangled cotton has increased. Benefits have been demonstrated in areas which contract braceroes, and where it is necessary to have the cotton open at the time hands are available to minimize the number of pickings.

• **Defoliants vs. Desiccants** — The question arises. "Should I use a defoliant or desiccant?" The answer is governed by a number of factors including the type of cotton grown, the end result desired and the type of harvesting method employed. In high-yielding cottons where the crop is set and matured over a considerable period, the use of a desiccant that causes rapid killing and drying would not be practical. On the other hand, for the smaller, more determinate storm-proof cottons, quick drying and once-over harvesting operation has much in its favor. The cost differential between a stripper and a picker also must be evaluated, particularly with the marked reduction in stripper prices this season. Some people believe that strippers have yet untested advantages in insect control programs, particularly in areas of heavy pink bollworm infestation. Further improvements in stripping machines may further expand their vista of operation into other sections of the Cotton Belt. The final decision of whether to use a defoliant or desiccant, therefore, logically rests with the grower after making a detailed analysis of his own situation.

A second question prominent in growers' minds is, "Will it pay?" The general consensus, supported by scientific studies, is that the use of pre-harvest chemicals will pay in terms of either reduced harvesting costs, timing and efficiency of harvest, or in improved grades and other less tangible benefits. In the case of stripper harvest before frost the practice is absolutely necessary. Only a few examples of reduced harvesting costs by use of pre-harvest chemicals and mechanical harvesting in Texas will be cited: along the Gulf Coast defoliation and machine picking have resulted in harvesting at approximately one-third the cost of hand harvesting, while in the Blacklands desiccation and stripping frequently result in a saving of $20 to $30 a bale over hand harvesting. However, increasing research knowledge also emphasizes that, with certain climatic and seasonable variations, the unqualified recommendation of using pre-harvest chemicals may not always be justified. For example, during

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dry seasons in the Mississippi Delta or on the High Plains of Texas, growers are frequently worried about early frosts that shorten the growing season. Tests through the years at the Lubbock Station have repeatedly confirmed that a defoliant in that area does not hasten maturity without harming yield or grade; perhaps during only one out of every three years would there actually be benefits in applying chemicals or in stripping before frost.

• **Are They Harmful?** — A number of studies have shown that both defoliants and desiccants will reduce quality of fiber and seed and final yields if applied prior to complete maturity of the bolls; desiccants usually cause greater damage than defoliants. The number of days to final boll maturity naturally varies considerably from one part of the Belt to another. Most authorities are now recommending that application be delayed until 50 to 70 percent of the bolls have opened. Timing of application, therefore, is the key to the successful use of preharvest chemicals.

Large scale field studies were conducted this season in several stripper areas of Texas using different chemicals and dates of cotton maturity. Results in the Central Blacklands where extremely dry conditions prevailed, may not be representative of a normal season. They do show that the criticism made this season and in previous seasons that pre-harvest chemicals lower grade, staple, or other fiber or seed properties can not be justified if proper application methods are followed. Although the harvested cotton from desiccant-treated plots was trashier than that from defoliant-treated plots there were no significant differences in stripping efficiency between chemicals or in fiber or seed properties compared to hand-pulled controls. The percent field loss was just as high in hand-pulled plots as in machine-stripped.

A thorough analysis has been made of all alleged cases of detrimental effects on livestock or man from present-day defoliants; in no case has it been found that the defoliants, properly handled and applied, were detrimental. Due caution, however, should always be maintained to avoid contaminating food or feedstuffs not only with defoliants but with any of our modern agricultural chemicals.

Entomologists Assigned For Khapra Control

Three USDA men have been assigned to work on Khapra beetle control in California. They are A. E. Cavanaugh, C. H. Rothe and J. C. Gilliland.

Fresno County Agricultural Commissioner John Wardle Dixon and Gilliland will have charge of control work in Fresno, Kings and Madera Counties. Rothe will have headquarters in Riverside, where he will direct control activities in Southern California.

Rotating Peanuts Pays

Harvested yields of peanuts have been more than twice as large from land planted to peanuts every third year as from land planted to peanuts every year. In tests at the North Florida Experiment Station, Quincy, yields were as follows: peanuts every year — 640 pounds; every two years—1,139 pounds; every three years—1,547 pounds.

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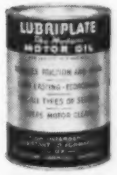

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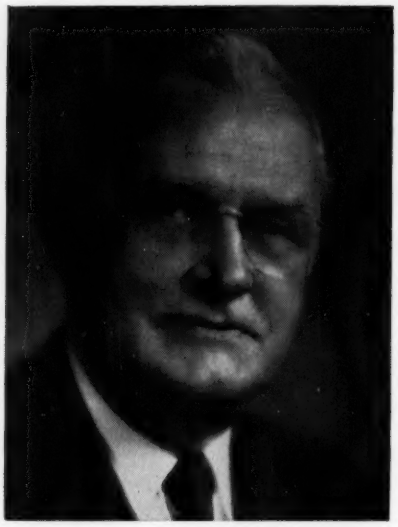
While present position of industry products has never been better, aggressive competition makes alert merchandising, farsighted educational activities and 100 percent support of research programs essential to continued growth.

The Competitive Position Of Cottonseed Products

By A. L. WARD



A. L. WARD, Dallas, is Director of the Educational Service, National Cottonseed Products Association.

COTTONSEED MEAL is now enjoying a position of respect among feeders and research workers in animal nutrition which has not been equalled in all the years of its history.

But, in seeming opposition to this assurance, the cottonseed crushing industry has never been in more critical need of processing and feeding research and merchandising programs which will increase its usefulness and maintain or expand its markets.

Livestock and poultry feeders are more conscious of protein needs and use more care in feeding adequate protein because of extensive protein education during the last quarter of a century. The value of adequate protein has been demonstrated, in experiments and in practical feeding, time and time again. Colleges, livestock leaders and the industry's own educational efforts have constantly reminded producers that livestock and poultry production is higher and more efficient, as well as far more economical, when the protein requirements of the animal are met. Education is a slow process but a firm and lasting impression of this fundamental fact is constantly gaining ground.

During recent years the value of livestock and poultry products has been at high levels. Such a condition has favored the use of adequate protein in rations and has increased per head consumption of protein supplements. Although adequate protein is equally important in times when livestock production margins are very narrow, it is much easier during so-called good times to stimulate feeders to make the necessary outlay for protein supplements.

Another factor in the demand for cottonseed meal and cake has been the almost constant increase in number of livestock and poultry units in the Cotton States where most cottonseed meal should be marketed. An increasing human population creates the market for livestock products which necessarily stimulates production. An increasing standard of living has added to the demand for meat, dairy and poultry products. An understanding that the agricultural economy of the South is aided by a strong livestock industry has moved much of the livestock population into the area where cottonseed meal seeks its market.

• **The Role of Research**—Few fully recognize how much research has contributed to the position presently enjoyed by cottonseed meal. Only the more experienced in the industry have a sufficient personal memory of the days when the socalled "cottonseed meal injury" in cattle was believed by the majority to be a result of feeding cottonseed meal. Research and education have removed that obstacle by showing the difficulty was caused by vitamin A deficiency. Hidden losses caused by protein hunger on deficient ranges have been widely demonstrated, thereby increasing the demand for cottonseed meal and cake.

More recently, research has been concentrated on processing and feeding tests which will win for cottonseed meal a favorable share of the poultry and swine feed markets. While much remains to be done, outstanding progress has been made. About a year ago, progress in our nutrition research program had reached the point that the industry was able to take advantage of a wide spread in cottonseed meal and soybean meal prices. A highly significant volume of suitable cottonseed meals was moved into these markets for the first time. Feed manufacturers eagerly accepted the meal because they believed our research program had proved the value of these meals and because their use reduced feed manufacturing costs and those of their customers.

This successful experience has provided a beachhead in these valuable markets which will make it increasingly easy to expand this important outlet for cottonseed meal as current and future research adds to the usefulness of cottonseed meal. No longer will the poultry feed manufacturer fear to put cottonseed meal on his feed tag lest his competitor use it against him in sales promotion. His competitor is also using cottonseed meal and the customers of both know it is good. It is the constant task of this industry and our research program to make it better.

More and more is being learned about the toxic properties of cottonseed meats for poultry and swine and how to process meals to reduce or eliminate the toxic material. Equal attention is being given to research which insures that the original high protein value of cottonseed protein is undamaged for poultry and swine feeding during processing. Modern rations demand that each ingredient be highly efficient for feeding simple stomach animals which do not have the ability to digest tightly bound nutrients in feedstuffs. The hope to win for cottonseed meals a permanent important place in these rations depends on the development of information which will insure that each lot of meal is equal or superior to other available protein concentrates in value contributed to the ration.

The advent of solvent extraction in certain segments of the industry raised questions in the minds of certain feeders because the earlier solvent extracted meals did not have the same texture and physical characteristics to which they had become accustomed in hydraulic or screw press type meals. Research by members of the industry and at experiment stations has been responsible for greatly improving this physical condition.

• **Competition of Other Products**—While cottonseed meal has made outstanding strides in the improvement of its own position, it has, at the same time, been subjected to increasing pressure of competition from other products.

The fact that the available supply of protein concentrates has never equalled the needs of the livestock population has obscured, to some extent, this competition. The history of the rapid rise of the position of the soybean industry is well known. The likelihood of a still more dramatic expansion of this and other forms of dietary nitrogen for livestock must cause the cottonseed crushing industry to take advantage of every available opportunity to conduct research, education and merchandising programs which will insure a favorable position for cottonseed meal.

The use of non-protein sources of dietary nitrogen, such as urea and ammoniated products, in the rations fed ruminants (cows and sheep) has reached important economic proportions. There is little doubt that much greater expansion is ahead. One of these products, urea, currently is being used extensively in formula feeds for cattle. It has been demonstrated that seven pounds of grain and one pound of urea will replace, to a limited extent, eight pounds of protein meal. While urea must be limited, under feed control regulations, to three percent of the concentrate ration and cannot provide more than one-third of the dietary nitrogen, these proportions, if used universally, can replace a large volume of the market enjoyed by cottonseed meal.

Ammoniated materials may offer an even cheaper protein replacement than urea. Difficulties have prevented the use of ammoniated molasses but certain other products may not produce the same

ill effects. It should be remembered that these products, including urea, are the products of industries which realize fully the possible value of research and take advantage of research to correct difficulties and decrease costs of production.

Low protein to medium protein formula feeds for cattle and sheep have provided an important market for cottonseed meal and steps must be taken to insure continuation of this outlet. At the same time, it should be recognized that, even though cottonseed meal is an ingredient in these formulas, the total consumption of cottonseed meal by the animals is usually reduced when they are fed the lower protein feeds to replace meal or cake.

A beef cow on the range which has, in the past, received two pounds of cottonseed meal or cake daily may obtain the same amount of protein from four pounds of 20 percent protein pellet. But, a part of this protein will come from the grain, alfalfa meal and other ingredients in the pellet. If cottonseed meal provided the only source of supplemental protein in the formula and the mixed feed pellets were fed to provide the same amount of protein as would be provided by two pounds of cake alone, the cow would be consuming 1.3 pounds of cottonseed meal instead of the two pounds formerly consumed. If urea were used in the pellet to the maximum extent, the daily consumption of cottonseed meal would be reduced still further about three-fourths of a pound of cottonseed meal.

A satisfactory solution to such obvious increasing competitive pressure can only come from alert merchandising of cottonseed products, farsighted educational activities and wholehearted support of worthwhile research.

Gilt-Edged Investment

(Continued from Page 22)

It is our responsibility, yours and mine, to answer that question.

Last year Harold Young presented us with this challenge in a masterly way. He presented it so squarely that we all knew we could no longer fail to face it. We knew that we had to make a decision. During 1954 we have been moving along the road that leads to a sound decision. We have not moved with undue haste, because we know that in a matter of this kind careful deliberation should precede the decision. We have not forgotten that it is much more important to safeguard the great program which we already have than to jeopardize it on any premature proposals for a change. We surely have not forgotten that every farmer, every ginner, every merchant and warehouseman and spinner and crusher, is involved in whatever decision we may reach. So we have moved forward very carefully and deliberately. In 1954 we have done two things:

• **Finance Program**—First and foremost, we have gone all-out in a drive to bring in every dollar that our present finance program can possibly bring. The Council's finance committee and its field service department have done a magnificent job. Many industry leaders have pitched in and have given real help. In 1947, the first year that our present finance program was in effect, the participation of the whole industry was 46 percent. From that day to this, we have had no increase in the rate of dues.

Can you think of any of your costs or expenses other than Council dues that have not risen in the past eight years? Yet the Council itself has been faced with big increases in the costs of its programs; it has been faced with steadily expanding research and promotional programs on the part of competing industries; and it has been faced with a bigger and bigger list of jobs that our own industry wants and expects it to do. For the money to cope with all this, we have had to rely entirely on our ability to get more supporting members into the Council. The participation grew from 46.0 percent in 1947 to 60.0 percent in 1953. Now, through a very intensive effort in the year just past, we have raised that figure to 64.7 percent. We must not relax our efforts to raise it still further, but I think we must all concede that the present level of participation is pretty good. We now have a very fine percentage of support from an industry which is so large and so widely dispersed.

• **Appraisal of Needs**—Now the second thing that we have done in 1954: In addition to all their regular duties the management and staff have prepared for your consideration a careful appraisal of the work that the Council needs to do and is unable to do for lack of funds. We surely would not suggest the need for more money unless we could lay before the industry some definite proposals as to how it would be used. Our delegates could not make a sound decision unless they received that information in clear and concrete form. This year a great deal of planning and hard work have gone into preparing just this information. The details will all be explained later. I merely wish to urge that you study these proposals for an expanded program very critically. I am not trying to sell you on the need for this expanded program. The officers and staff are not here in an attitude of trying to sell you on this expansion. Our attitude is simply this: Here are some facts to which you are entitled. We feel a definite obligation to give you these facts. As the people who carry on your program, we know that we are only able to do a fraction of the jobs that we could do for you if we had the money. We want you to know exactly what the opportunities are that are being neglected. We want you to know that our industry may slip backward and lose ground to its competitors unless we expand our program. On the evidence it appears that every dollar you invest in that expansion may yield you hundreds or thousands of dollars in return. But the decision is for you, and you only, to make.

My service as chairman of your budget committee for 13 years and simultaneously for the last eight of those years as chairman of your operation policy committee has given me a rather intimate view of the Council's operation. Based on this knowledge, I say to you that we are getting all the program possible from the present budget. There is no waste. The water has all been squeezed out of it. We have had to turn down many proposals for new work of real merit, because we didn't have the money. If we want an expanded program, we must have an expanded budget.

• **Year of Achievement**—As 1954 goes into the record, we can mark it down as one of real achievement for the work to which the Council is dedicated. To be sure, we must also count some developments that are discouraging. Our planted acreage was cut below 20 million, compared with 25¼ the year before. In spite of this we have grown a crop estimated at more than 13½ million bales. Our export market was much better in calendar 1954 than in the two preceding years. Our domestic market began recovering in the fall. Yet in spite of these improvements in the off-take, and in spite of the curtailed acreage, we hear estimates that no reduction in the large carryover will be made. Accordingly we face a more severely curtailed acreage in the season ahead. At the same time there is a big excess in the supply of edible oil over the demand, and the government is holding a large quantity of cottonseed oil and linters.

Our whole industry, including particularly the farmer, is becoming more efficient year by year. We have a fair-sized crop, in spite of a low acreage, because the farmer has broken all previous yield records by a wide margin. Every branch of the industry has invested heavily in new capital goods to improve its efficiency. These investments were necessary to fill the nation's critical needs of just a few years ago. Now, with a higher and still rising efficiency, we see that a crop of 13½ million bales leaves all of us, **including especially the farmer**, with more excess capacity than a crop of that size would have left us in years past.

• **Must Expand Markets**—What can we do about it? There is only one answer that makes any kind of sense to Americans: **We must expand our markets.** This has been the keynote of the Council's program from the beginning. We have seen our domestic market expand from just over six million bales a year to a normal level of nine million. As we look to the future we must—**we absolutely must**—resolve to keep that domestic market trending upward, and also to set in motion a real upward trend in our export market as well. There was a time when we could think complacently about a cotton economy geared to a market for 13 to 14 million bales a year. That time is gone. If we require any proof, we can see it in the condition of our whole industry this season. We must (all of us) continue lowering our costs of operation and improving the quality of our products, if we mean to stay in business. But the farther we go in this direction, the more essential it becomes that we have bigger and expanding markets. In the world of fiber and oilseed competition, there is no such thing as standing still today. We will have to be a progressive industry, steadily expanding its markets, or we will drop out of the picture and give up even our present markets to our competitors. This Council stands as the symbol of the choice we have made. We are going to fight for expanding markets. We intend to hold our competitive position or improve it, and to go forward as population and living standards rise in this country and all over the world.

The year just past has brought many accomplishments which have kept us moving toward this goal. Fine work has been done in each of our four divisions: sales promotion, utilization research, production and marketing, and foreign trade—and also by our Washington office. I wish I could discuss a great deal of it with you. In the time available I can only mention two big features of the year's activity:

(1) For research and extension, the federal government increased its appropriations by $18 million. This was the largest increase on record, and we be-

lieve it can be followed up by another large one in 1955. This is a victory of top-rank importance for all of us who believe that the future of cotton depends on technological progress.

We do not ordinarily point with pride toward increases in government appropriations. We surely believe that private enterprise has a major share of the responsibility for research, but one of the oldest and soundest functions of the federal government is to do a certain portion of the research and educational work in the field of agriculture. At the same time, this is one of the few governmental activities which have been neglected in recent years. In reversing that policy of neglect, the government took a long step in the direction of real progress. The Council has advocated it, worked for it, and fought for it through the years. We are proud to say that we put a great effort behind the specific increase which occurred in 1954—an effort, in fact, which had been under way for two full years.

(2) In promotion, many achievements of 1954 could be mentioned, but there is time for only one. Our example in expanding our domestic market has been capturing the imagination of textile associations in one foreign country after another. They have been sending their key men to study our programs and insisting that we send ours to visit them and give advice. For the third straight year this interest in our methods of market development has been building up. In 1954, the federation of European textile associations passed a formal resolution asking the National Cotton Council of America to increase this kind of cooperation. We have been making plans to station some of our most experienced men in Europe temporarily to advise them.

The emphasis of these programs is on the home markets of the various countries. We have been encouraging that emphasis. In all of this, the Council has been especially concerned to see that our own textile industry would not be hurt, but helped. We never forget that the spinners of this country are our biggest customers by far. But they will stand to benefit, along with all the rest of us, if the demand for cotton textiles is increased in Europe and the rest of the world. We never forget, either, that 94 percent of the world's people are in foreign countries. The greatest potential expansion for all of us, including our textile industry, may be abroad. The soundest way to increase our exports is to help promote the demand for cotton products in foreign lands. This is what we are now doing on a rapidly expanding scale. It holds a great deal of promise for the future of our markets.

So I say that the work of the Cotton Council took another great stride forward in 1954. We are still having our eyes opened to immense new opportunities. We had our discouragements in the 1930's, but those of us who founded this Council were optimistic for the future—and our optimism proved correct. And again today we have our discouragements, but again we can be optimistic. Let us look at how the economy of the whole world is growing. Let us consider how much has been done to build up the competitive strength of cotton. And let me tell you that if we keep pushing forward with the work this Council is doing, we may see our market grow to 20 million bales a year within the lifetime of many people in this audience.

But let me emphasize that we will not reach that goal unless we keep our determination to fight for it. Today, and in the year ahead, we can see as many threats and challenges as this industry has even faced in the past.

In Washington there is always something for us to worry about. This year we are being threatened, among other things, with a further increase in the legally required minimum wage. We believe in good wages. We expect and hope that the wages paid by every branch of our industry will go on trending upward, as our rising productivity makes this possible. But the productivity of people cannot be increased by passing a law. It can only be retarded thereby. Federally required minimum wages, which apply uniformly across the whole nation, represent nothing more than an effort to hold back the development of our poorer regions. We have opposed, and I hope we will always oppose, that kind of thing.

The synthetic fiber industry has been stunned by the come-back that cotton has staged in recent years. It was inevitable for that industry to redouble its own efforts to gain markets at our expense. Its leaders are not lacking in capital, brains, or resourcefulness. They are rapidly expanding their great programs of research and promotion. They have been coming back at us in many ways, and we must be equal to the challenge.

For one illustration I will mention the blending of rayon into cotton fabrics. The rayon industry has failed in its effort to capture most of our markets. Now we see it coming back with a big effort to slip into parts of those markets in the form of 30 or 40 percent blends with cotton. I refer to this in order that we may recognize it as the major threat which it is. We must meet it with new efforts from our own side, featuring both promotion and research, all of it well planned and coordinated.

• **Challenges Are Ahead**—So once again we find that the year ahead brings new challenges. Year after year, new jobs are added to the Council's load, but few old ones are discarded. We are living in a day of ever-increasing emphasis upon promotion and research. Fibers and oilseeds are especially affected. As always, our industry is concerned with a great variety of governmental problems, local, national and international. Since the Council has come to be known as an effective organization, the calls upon it become greater all the time. We cannot do everything that needs to be done, but we must review our whole program to be sure we are covering just as much ground as possible with our present resources. And now we must also consider the wisdom of increasing the Council's resources so that more can be done.

I am considered a conservative in my nature and in my philosophy. My views as expressed in the counsels of this organization have been conservative views. As we think here today of our need for an expanded program, I would add once more an appeal for the conservative viewpoint. We should carefully weigh the costs. We should count the difficulties. We should not move too hastily. We should insist on examining all the facts. But it also means that we should face those facts squarely and honestly when they are put before us. A conservative is not a man with a bias against progress. On the other hand, the conservatives of this nation are the real champions of progress. The socialists are in favor of dividing up the wealth, which ultimately will result in all sharing the poverty. The conservatives are in favor of building on and on toward a richer and better nation for us all. It was under a conservative leadership that this industry rallied in the dark days of the 1930's, formed a National Cotton Council, and began a new era of progress.

• **It Has Paid** — As conservatives we asked the question, "Will it pay?"

As a conservative I now answer, "Yes, it has paid."

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7-Step Program

(Continued from Page 24)

worker in 12 months. Farmers had to turn to mechanization and labor-saving methods.

There is no longer any doubt about the practicability of mechanical cotton production. However, there are many questions on how to use, when to use and when not to use certain attachments. In the final analysis, the grower or producer of cotton will have to decide these questions based on his knowledge of the machine, his farm and his managerial skills. There are several important considerations in preparing for a crop, growing the crop and "laying by" the crop that affect the efficiency of operation of all machinery throughout the year.

Field layout and drainage play a very important part. Many times the drainage is not good enough to get all the water off after a rain. Loss of time and excessive wear on the machine will result. Proper drainage, row arrangement, type soil or field selection, cover cropping or fair amount of organic matter in the soil enable machines to be used quicker after rains, or at the proper time.

There should be enough machinery on each farm to do the job when the soil is in condition. Preparation of seedbed should be made to suit equipment needed to produce and harvest the crop. Level seedbeds are best for use of pre-emergence and post-emergence herbicides, flaming, level and shallow cultivation. It is most important that uniform row height be obtained.

Stalks should be shredded or cut in such a manner that their complete decomposition will be completed by planting or early cultivation of the crop. If large parts of stalks are present at cultivation time, they may clog the rotary hoes or sweeps and cause large areas of the cotton drill to be destroyed.

Flat-breaking of land, as a rule, makes for better drainage. If flat-breaking is done, the soil should be turned over with a mold board plow. It should be broken about six inches deep, thereby turning under the crop residue. No diseased stalks are left on the surface to interfere with planting or cultivation. Diseased stalks are below the seed drill and root zones of the young plants.

Equip the planter with a front gang on the cultivator so that the cultivator will throw up a low seedbed. Guards ahead of the planter swords drag off the bed to three inches above the middle and leave a uniform bed height.

Cross-plowed cotton tends to slug the picker drum and does not do as efficient job of getting the entire crop. However, due to the shortage of labor for hand hoeing and since chemical weed control has not been the answer in grass and weed control, cross-plowing is considered the best or cheapest way to control grass and weeds.

Hill-dropping of plants, five to nine seed per hill, 10 to 16 inches apart in the drill, causes plants to grow tall rapidly and enables earlier use of herbicidal oils for grass control.

Close spacing in drills causes bolls to set up higher on stalks and gives a more uniform feeding of stalks into the picker head. Flaming burns off lower limbs and leaves and reduces trash in mechanically-harvested cotton. Flaming late in the season to kill late crab grass reduces the amount of grass seed in seed cotton. Grass leaves, stems and seed are almost impossible to remove from seed cotton at the gin. Some few have successfully used flame in controlling late weeds and grass. Flamed cottons have a tendency to clean better at the cotton gin, and they also make for better picking with the machines. Machine-picked, flamed cotton takes in 4½ pounds less trash than unflamed cotton. Tests in 1945 showed as much as one-half of a grade improvement in flamed cotton.

Cultivating shallow, to prevent bringing new grass and weed seed to the surface, reduces wear, minimizes breakage and reduces operating cost of the cultivating equipment, besides making control of the tractor easier. Another advantage is a firmer middle remaining which gives the mechanical cotton picker a better footing, particularly if rains should be the rule.

• **Step 5**—"Control Diseases and Insects," is the insurance part of the entire program.

Cotton seedling diseases cause expensive replanting in those years when spring temperatures are below 55 degrees. Seed treatment helps to reduce disease damage done to cotton seedlings.

Quick absorption of water resulting from subsoiling allows the soil in the drill to warm up faster. A better stand is secured on a well-drained, firm seedbed.

As soon as cotton seedlings are up and have two cotyledon leaves, two insecticide applications should be made, seven days apart. Thrips and cutworms are the first insects, usually, to attack young seedlings. Insect control at this time allows leaf development, and this is beneficial to root development—consequently, healthier cotton plants with stronger root systems result. Boll weevils coming out of hibernation are controlled prior to the time of squaring, with three applications of insecticide at four to five-day intervals.

When blooms appear, the percent of weevil-punctured squares should be held below 10 percent. Make three applications, four to five days apart, to keep infestation below 10 percent. Keep a close watch for tiny boll worms and apply three to four applications if needed, at four to five-day intervals. Proper timing of insecticide applications protects all the fruit and assures a high percentage crop set. The cotton stalk is dwarfed when heavily loaded with a uniform boll crop distributed over the entire plant. Bolls should be protected from late boll weevil and boll worm damage to insure harvest of a maximum crop.

Relationship of number of applications of insecticides to cotton yields on Mississippi 5-acre cotton contest plots—1954.
(Average of all records received)

Number times poisoned	Delta	N.E. Hills	South Miss.	Average of all plots
	Pounds of lint cotton per acre			Lbs./acre
None	405	—	680	542
1 to 3	470	679	507	552
4 to 6	835	851	567	784
6 to 8	863	874	680	805
8 to 10	1,129	899	724	914
10 & over	1,365	1,176	1,012	1,184

1954 was a dry year as compared with 1949 and 1950. These data illustrate what can be done with a complete cotton production program in extremely dry years. Boll worms were a problem on most farms in 1954. Increase in number of insecticide applications properly timed gave profitable increase in yields of lint per acre.

• **Step 6**—"Harvest and Gin for Higher Grade and Staple Value," means the same thing as harvest and gin to preserve quality of fibers.

If needed, defoliate when 60 percent of the crop is open. In dry years, spray defoliants have given good results. In years with plenty of dew, defoliant dust has given best results. Defoliation is an aid to mechanical harvesting; it removes leaves to allow entire crop of bolls to open more uniformly. A higher percent of the crop can be picked at one time. Removal of leaves also prevents boll rot during rainy seasons.

In 1934, 55 percent of the Mississippi cotton crop graded Strict Middling and above, as compared to the 1954 crop, when 15 percent graded Strict Middling and above.

Seed cotton must be picked early for good color; and it must be kept clean and dry before ginning if highest grades are to be obtained. Large amounts of trash and high percent of moisture in seed cotton cause rough preparation when poorly ginned.

• **Step 7**—"Market for Grade and Staple Value," is our "lucrative" advice. If you use the best land on the farm, use high rate of fertilizer, prepare seedbed thoroughly, plant pure seed, control insects, harvest and gin properly, and then fail to study the market before selling, you may realize a loss of $15 to $33 per acre. You cannot afford to leave off any one of the improved practices adapted to your farm and expect maximum net profit per acre from cotton.

• **Summary:** The Mississippi 5-Acre Cotton Improvement Contest was organized to demonstrate the 7-Step Cotton Program. Several hundred 5-Acre Cotton Contest farmers have proved through results they have obtained that two bales per acre can be easily grown in Mississippi.

An institutional 7-Step Cotton Committee helps promote the practices in the 7-Step Cotton Program recommended. Research information is reviewed and written into revised publications as needs arise. Radio and television programs are used to inform the public as to the accomplishment and value of following a complete program.

Sixteen business organizations who realize the need for cotton improvement in Mississippi have cooperated with the Mississippi Extension Service by sponsoring the 5-Acre Cotton Contest. Industry made available to farmers the needed supplies in time for practices to be completed.

It has been said many times that the combination of the 7-Step Cotton Program and the 5-Acre Cotton Contest has done more for cotton yields in Mississippi than any other tried program.

Fats and Oils Help Save Carotene in Alfalfa

USDA reports that use of a fat or oil will cut carotene loss in alfalfa. Green alfalfa has plenty of the substance, a pro-vitamin that poultry and other livestock convert into vitamin A. But when alfalfa is cut, converted into dry meal, or stored as feed, much of this carotene disappears.

Recent tests show that meal treated with five percent of animal fats retained nearly twice as much carotene as untreated meal, and several vegetable oils have given good results, too.

■ **BILLY B. DARNELL now is gin inspector for the insurance department of Western Cottonoil Co. He formerly managed the Paymaster gin at Wheeler, Texas.**

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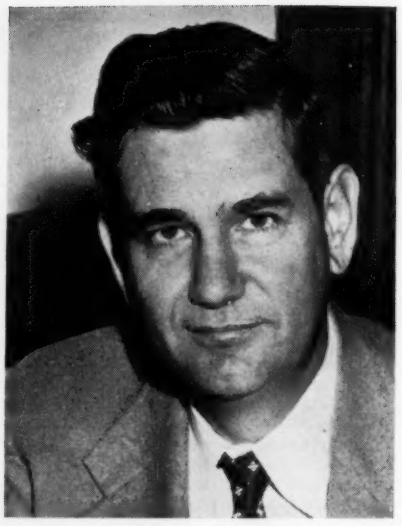

CRAWFORD C. MARTIN

Texas Purse Strings in Good Hands

TEXAS has the purse strings of the state in good hands—those of the two active ginners shown here. Senator Crawford C. Martin of Hillsboro is chairman of the Senate finance committee, as well as actively operating a gin in Hill County; and Representative Max C. Smith, San Marcus, ginner and past president of Texas Cotton Ginners' Association, has been selected for an unprecedented second term as chairman of the House appropriations committee. Also on this committee of the House are ginners Leroy Saul of Kress and J. F. Ward of Rosenberg. Senator Martin is serving his eighth year in the state legislature and Representative Smith his twelfth year. Senator Martin also has been named president pro tem of the Senate and will serve as Governor when the Governor and Lieutenant Governor are out of the state.

Story Says Progress Made On Oil Trade Barriers

Mellorine, the frozen dessert containing cottonseed oil, had much educational work done on its behalf in 1954, A. L. Story, Sikeston, Mo., said in Houston at the annual meeting of the National Cotton Council. He heads the Council's trade barriers committee.

No new states were added to the 10 which now permit the manufacture and sale of mellorine, Story said, but attempts may be made to lift discriminatory bans in 10 new states in 1955, with defensive or corrective legislative action slated in six others.

Regarding margarine, Story said that while the big job of removing restrictions has been accomplished, continued attention should be given to: (1) rescinding laws in the two remaining states which ban colored margarine, (2) removing discriminatory taxes in the 13 states that penalize margarine, and (3) lifting restrictions in the four states which prohibit margarine sales in public eating places. He recommended also that continued efforts be made to pass federal legislation permitting the Navy and Marine Corps to serve margarine in their messes.

In the shortening market, which continues as the largest outlet for cottonseed oil, Story declared a close watch was being maintained on chemical substitutes which threaten to replace a lot of shortening in commercial baking.

"The Council has never taken action against these substitutes simply because they are competitors. We do feel, however, that until they are proved nontoxic and until their nutritive effect is fully known we do have cause for concern and action in this regard," Story said.

• Spain To Purchase Cottonseed Oil

USDA has announced an agreement with Spain whereby about 42 million pounds of CCC-held bleachable prime summer yellow cottonseed oil may be supplied to that country.

Spanish representatives are expected to negotiate with U.S. firms for their services in procuring the oil from CCC, and having it processed and delivered to designated ports.

CCC prices per pound for and approximate quantities of oil, delivered to refineries, in the different areas for export to Spain are as follows: New York, 3,200 metric tons, 13.20 cents; Gulf and Southeast, 8,000 metric tons, 12.52 cents; and West Coast, 8,000 metric tons, 12.17 cents.

Firms successful in negotiating contracts with Spanish representatives should submit offers to purchase to F. P. Biggs, New Orleans CSS Commodity Office, 120 Marais Street, New Orleans 16.

Irrigated Pasture Booklet

Beef Cattle on Irrigated Pasture is the title of a new California Extension Service booklet which is available to interested persons. It contains an analysis of the cost factors in planning beef production on irrigated pasture in California. Irrigated pasture, the booklet points out, is cheaper than harvested crops, but more expensive than natural range.

■ **CLYDE R. KEATON has succeeded J. Z. ROWE as Extension economist at New Mexico A. & M. College. Rowe resigned recently to take a position with the Federal Reserve Bank in Dallas.**

Ginners who are not equipped to handle machine-harvested cotton have been finding themselves, like the village smithy, without customers. That is one good reason why every ginner should read this article.

Tips on Ginning Cotton Harvested Mechanically

By CHARLES M. MERKEL
And VERNON P. MOORE

EACH YEAR toward the end of the ginning season, ginners begin to think of their needs for the next year. The problems which have confronted them in handling the current crop are fresh on their minds, and they are seeking a solution so as to be in a position to render better service to their customers during the coming season. In this highly competitive enterprise the ginner realizes that adequate volume is the first prerequisite to continued success, and volume can be maintained only by performing a good job for his customers.

In recent years gins which did not modernize to cope adequately with trends in harvesting practices in the gin territory soon gave way to the plants which were equipped to perform the services demanded by the farmers of the area. In the Cotton Belt as a whole there are about 500 fewer gins now than there were just five years ago. The only area showing an increase in the number of gins has been the Far West, where cotton production has been substantially expanded in recent years.

Since 1946, the amount of hand-picked cotton has decreased over 25 percent, while the amount of machine-harvested cotton has increased from nearly nothing to about 20 percent of the total crop. The percentage of hand-snapped cotton has shown only a slight increase[1]. (See Figure 1.)

The increase in machine harvesting has complicated ginning problems in that the seed cotton requires an increased amount of preparation such as drying and cleaning prior to the actual ginning operations in order to maintain fiber and seed quality.

Machine stripping has been practiced for a number of years in the High Plains area of Texas and in western Oklahoma, but in recent years has spread to other areas. Machine picking started in the Mississippi Delta and in the Far West and has spread, more rapidly than stripping, to other areas of the Belt.

• **Helping Mechanization** — The staff of the U.S. Cotton Ginning Research Laboratory at Stoneville has watched with keen interest the spread of mechanical harvesting. For the past 10 years the ginning research program has devoted considerable effort to finding ways and means of handling rough-harvested cotton at the gin to maintain high grades and preserve inherent spinning quality.

Out of this research program have come a lint cleaner, green boll trap, feed control device, and recommendations for the amount and sequence of seed cotton cleaning machinery and drying equipment—to name a few. The laboratory recommendations, resulting from a number of years of research, have been proved to be sound and practical by the field testing of gin machinery manufacturers. The manufacturers generally are following the laboratory findings in making recommendations to their customers whether they are modernizing a plant or building a new gin.

The requirements for handling roughly-harvested cotton at the gin have been stressed by the laboratory personnel, the Extension Service, and representatives of the machinery manufacturers at meetings and with ginners individually at every opportunity. Almost invariably, however, the ginning results are generally poor each year in areas where mechanical harvesting practices are employed for the first time.

In almost every instance some of the farmers will decide to purchase equipment for mechanical harvesting without realizing the impact their decision will have on the gins in the area. In many cases farmers apparently do not ascertain whether the gins are equipped to handle the cotton. If roughly-harvested cotton cannot be handled effectively, producers' investment in mechanical harvesting equipment may prove to be a liability rather than an asset. Under these circumstances the ginner will make an effort to handle the cotton with the equipment at his disposal or with hasty, makeshift additions that may prove unsatisfactory. Ginners would gain advantage by learning farmers' intentions for the coming season so that necessary changes can be properly planned and engineered.

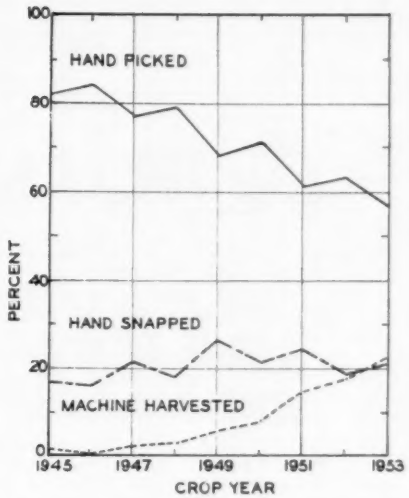

Figure 1.—Percentage of crop harvested by various methods, 1945-53, is shown in this chart.

There is much to be learned by both the farmer and the ginner with respect to mechanically-harvested cotton. The ginner may safely assume that mechanically-harvested cotton will reach the gin in better condition after the farmer has had one season of experience in the use of mechanical harvesting equipment. It has been observed that usually the gins are one year behind the farmers in the early stages of mechanical harvesting in a given area.

• **Best Grade But Low Turnout**—Farmers frequently will patronize alternately all of the gins in the area, seeking higher grades and better turnout. It appears to be somewhat of a shock to

CHARLES M. MERKEL, left, is engineer in charge, and VERNON P. MOORE, right, is cotton technologist at U.S. Ginning Laboratory, Stoneville.

[1] Charges for Ginning Cotton, Costs of Selected Services Incident to Marketing, and Related Information, Market Organization and Costs Branch, AMS, USDA.

Table 1.—The effectiveness of the laboratory-designed stick removal device in removing foreign matter of various types from machine-stripped cotton.[1]

Type of foreign matter	Foreign matter content of seed cotton before stick remover [2]		Foreign matter extracted by the stick remover [2]	
	Pounds	Percent	Pounds	Percent
Sticks and stems	60.0	3.0	31.1	51.8
Hulls	408.0	20.4	306.4	75.1
Leaf trash	146.0	7.3	83.8	57.4
Motes	—	—	12.2[3]	—
Total	614.0	30.7	433.5	70.6

[1] Average of seven replications.
[2] Based on 2,000 pounds of machine-stripped cotton per bale.
[3] The motes in the stick remover trash were separated and weighed but no measure was made of the motes in the seed cotton wagon sample.

many that the gins giving the better grades also give the lowest turnouts. In order to obtain relatively good grades from mechanically-harvested cotton, large quantities of foreign matter and moisture must be removed at the gin.

In terms of weight per bale of seed cotton, foreign matter in relatively clean hand-picked cotton ranges from 15 to 40 pounds; in roughly hand-picked cotton, 50 to 150 pounds; in snapped cotton, 400 to 600 pounds; in mechanically-picked cotton, 25 to 75 pounds, and in mechanically-stripped cotton, 600 to 1,200 pounds. Moisture in cotton varies considerably, depending on the time of harvesting and weather conditions, but generally the moisture is substantially higher in machine-picked cotton than hand-picked cotton harvested at the same time. This is due to the moisture added to the picker spindles and, in some instances, to the inclusion of green foreign matter in the cotton. Mechanically-stripped cotton, harvested before frost, contains a large percentage of moisture due to green foreign matter and unopened green bolls, thus contributing substantially to decreased turnout.

The amount of seed cotton required to make a 500-pound bale will depend to some extent on variety, but these varietal differences are rather small as compared to the amunt of foreign matter and moisture in the cotton. Disregarding moisture, a bale requires about 1,350 to 1,400 pounds of hand-picked seed cotton, 1,400 to 1,550 pounds of rough hand-picked cotton, 1,750 to 2,000 pounds of snapped cotton, 1,375 to 1,500 of machine-picked cotton, and 2,150 to 2,600 pounds of machine-stripped cotton Thus, it may be seen how drastically the turnout is affected by rough harvesting practices and why some farmers have difficulty in putting enough roughly-harvested cotton in a trailer that would easily hold enough hand-picked cotton to make a bale.

The amount of foreign matter remaining in the cotton after proper cleaning and ginning covers a relatively narrow range. A 500-pound bale of relatively clean hand-picked cotton will contain about 14 pounds of foreign matter, machine-picked cotton about 25 pounds, and machine-stripped, about 40 pounds. The large amounts of foreign matter that must be removed from roughly-harvested cotton to produce bales of satisfactory grades require a rather elaborate amount of seed cotton cleaning machinery and a sizable outlay of capital on the part of the ginner. Even thuogh only a relatively small percentage of the cotton brought to the gin is mechanically harvested, the ginner will find that in most instances he must prepare to handle it.

Laboratory tests show that the equivalent of two tower driers, a bur machine, 18 to 24 cylinders of cleaning, large extractor feeders and lint cleaners are necessary to obtain satisfactory grades to make mechanical harvesting economically feasible. The sequence in which the cotton goes through the equipment is important. It should come from the trailer through a drier to a six or seven-cylinder cleaner emptying into a bur machine, from which it is conveyed to the second tower before passing through the remaining 12 to 14 cylinders of cleaning, extractor feeders, gin stands and lint cleaners.

It has been observed that ginners in areas where mechanical harvesting practices are just beginning usually feel that less equipment will suffice. After one or two seasons, however, they find that a large amount of equipment is necessary to perform a creditable job.

It has also been observed that gins that have a minimum amount of cleaning equipment will at times over-dry mechanically-harvested cotton in an effort to clean it. This practice is being discouraged and the harmful effects of such practices on the spinning quality of the lint have been pointed out at every opportunity. It is short-sighted and detrimental to the entire industry to attempt to substitute over-drying for adequate cleaning.

• **New Equipment Aiding** — Developments in gin equipment during the past 10 years have made mechanical picking and, under certain conditions, mechanical stripping, economically feasible, but much is left to be desired. Auxiliary equipment, which has been developed and is now in general use, is aiding materially in handling the roughly-harvested cottons. The green boll trap and bulk feed control device are examples of such equipment.

Developments now under way that will materially aid the ginner in handling roughly-harvested cotton include a stick removal device, which is being subjected to extensive evaluation tests at the laboratory and operational tests in a commercial gin.

In the laboratory, extensive evaluation tests are being made using hand-picked, machine-picked, and machine-stripped cottons. These tests should show the best location for the device in the system, the amount of cleaning that may be expected, together with its effectiveness in the removal of sticks and other foreign matter and its effect, if any, on spinning performance.

Evaluation of the data resulting from the 1954-55 tests is not complete, but preliminary tests appear very promising, not only for the removel of sticks and stems but other types of foreign matter as well. Tests have shown that about 70 percent of the 614 pounds of foreign matter in the seed cotton of a machine-stripped bale can be removed by this device (Table 1). An analysis of the foreign matter showed that the machine removed 51.8 percent of the sticks and stems, 75.1 percent of the hulls, and 57.4 percent of the leaf trash. Typical samples of the seed cotton before and after cleaning and the types of trash removed are shown in Figure 2.

Even with the advancements being made by the gin machinery manufactur-

(Continued on Page 76)

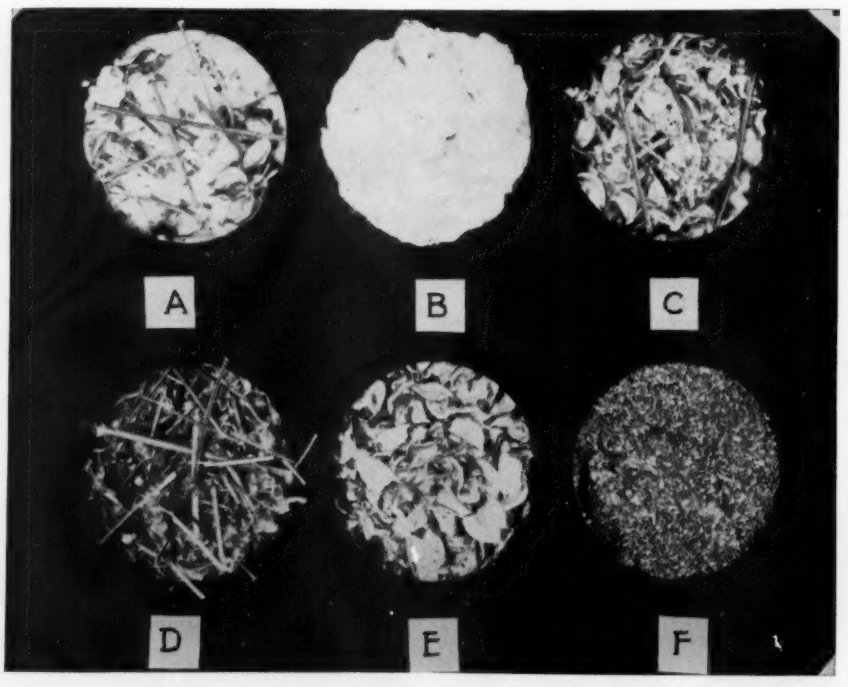

Figure 2.—Typical samples of roughly-harvested seed cotton before and after cleaning, and representative types of trash removed from the seed cotton, are shown here. A—seed cotton before cleaning; B—seed cotton after cleaning; C—trash removed; D, E, F—component parts of trash: D—sticks and stems; E—hulls; and F—fine trash.

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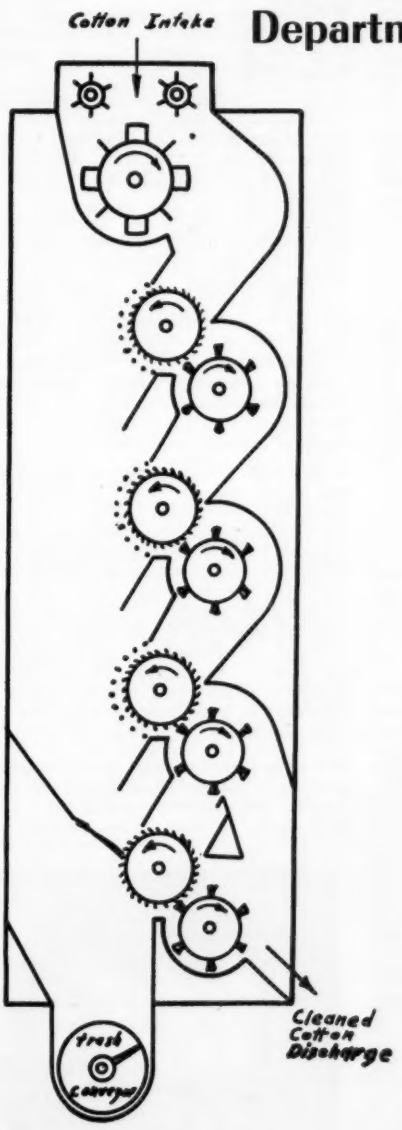

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"When Competition Is Keenest, Install a Hinckley"

Using the 10 recommended steps for good harvesting, handling and ginning makes good sense, say Extension Service workers. Here is an outline of what to do, as well as reasons why.

Good Cotton Harvesting Pays

By FRED C. ELLIOTT and E. H. BUSH

TEXAS in 1954 had continued increases in the total of cotton harvesting machines used. According to county agents' annual estimates, there were 1,532 spindle type pickers in 78 counties and 18,877 cotton strippers in 133 counties. This compared to 1,557 spindle pickers in 83 counties and 15,088 strippers in 130 counties in 1953.

Even under drouth conditions and acreage controls, the numbers of spindle type pickers remained about the same while cotton strippers increased approximately 25 percent over 1953. Farmers are requesting more information each year on production practices, harvesting, handling and ginning.

To make recommendations for good harvesting, handling and ginning, research and extension workers have outlined the steps to be followed for best results. They are as follows:

• **Bed and Plant on 40-inch Rows** — Since most of our present equipment is basically designed for 40-inch row widths, the machines, even though adjustable, are usually more efficient when operated on a standard row of 40 inches. Tests have shown no loss in yield or detrimental effects from 40-inch rows. Therefore, it is wise to take advantage of the benefits of ease of adjustment and operation provided in the basic design.

• **Plant Adapted Varieties** — Cotton breeders have developed two types of cotton, storm-resistant and normal boll, for the two types of machines, the cotton stripper and the spindle-type picker.

Machine harvesting tests have shown variations in the efficiency with which the machines strip or pick the different varieties of cotton. Where the recommended varieties are planted and machine-harvested, 98 percent efficiency can be obtained.

In general, open boll varieties are planted and machine-picked in the Texas Lower Rio Grande Valley, South Texas, along the Gulf Coast, through the Blacklands (river bottoms in particular), the Pecos and El Paso areas. The storm-resistant varieties are planted and machine-stripped on the High and Rolling Plains and the Uplands of Central Texas.

Numerous instances are on record where producers have machine-picked or stripped cotton with less field loss and obtained higher grades than where the cotton was hand-harvested under identical conditions.

• **Plant Properly-Treated Seed** — Planting seed that are properly treated helps control seedling diseases. This results in better stands for machine harvesting. Also, seed treating will help in controlling angular leaf spot and this contributes to higher grades. If a grower saves his own seed, he should treat them with a recommended fungicide at least one or two days before planting. If the seed are purchased, then the grower should make sure that they have been correctly treated.

• **Use Recommended Plant Spacing** — Proper spacing of plants in the field has long been a controversial subject among farmers. Experiments at various Texas Stations indicate that a spacing of 50,000 to 60,000 plants per acre is optimum for good machine harvesting. The stand should be uniform and without skips in the row. Since one plant per foot is about 13,000 plants per acre on 40-inch row spacings, a spacing of three to four plants per foot will give the recommended population. A bushel of seed contains approximately 125,000 seeds; consequently, 50,000 to 60,000 plants per acre would be approximately one-half bushel of seed. However, since the germination of seed is rarely 100 percent it will probably be advisable to plant approximately three-quarters bushel of seed to obtain 50,000 to 60,000 plants per acre.

This plant spacing does five important things. The plant height is reduced, giving a small compact plant which is much easier to harvest efficiently. The fruiting branches are raised higher off the ground. Experiments have shown that fruiting branches can be made to appear on the stalk approximately six inches above the ground with proper plant spacing.

The third effect which is important is the shortening of the fruiting limbs. With proper plant spacing, the fruiting limbs of the stalk are held to a minimum and are considerably shorter than the thinner plant spacings.

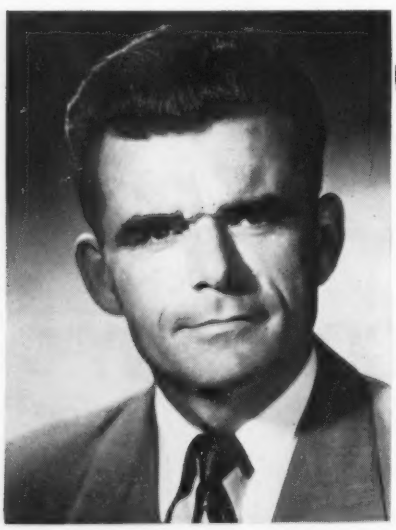
Another benefit, readily recognized, is that the field loss is much lower where the cotton is planted thicker. A definite reduction in the amount of field loss per acre can be had by proper plant spacing.

The last benefit which may be seen from the recommended plant spacing is the reduction of stick, stem and leaf trash obtained in the seed cotton after harvesting. This, of course, results in much less trash in the wagon to be taken to the gin and, consequently, in higher grades and an easier job for the ginner.

Other benefits from recommended plant spacing are a more uniform ripening of fruit and, indications are, a slightly earlier maturity.

• **Control Grass and Weeds**—Keeping the field free of grass and weeds is a "must" if we are going to machine harvest. Grassy bales are not wanted in the loan and draw a penalty on the market. Also, at present, there are no gins which will take all the grass out of lint cotton. If a cotton field is grassy, the machine will harvest the grass right along with the cotton. Therefore, such practices as the use of the rotary hoe, spot-oiling of Johnson grass, and other chemical and mechanical weed control practices are attracting much attention.

• **Control Insects**—It goes without saying that cotton insects should be controlled in order to obtain higher yields and better grades. This certainly adds



E. H. BUSH, left, is Cotton Gin Specialist and FRED C. ELLIOTT, right, is Cotton Work Specialist with the Texas Extension Service.

to the efficiency and lower cost of machine harvesting.

• **Defoliate**—It is pretty well agreed that defoliation for machine harvesting cotton is a "must" in Texas. This is especially true in the case of stripper harvesting. In areas where defoliation is not accomplished by frost for this method of harvest, then, defoliation must be done with chemicals.

Fortunately, good defoliation materials are now available. They are not foolproof yet, but there is a wide range of materials available for the varying conditions. A defoliant can be applied that will do a good job. Machines operating in defoliated fields will get more cotton with less leaf stain or trash. Improved lint quality will result. Even hand pickers prefer defoliated cotton.

• **Keep Harvesting Machine Clean**—The importance of keeping the harvesting equipment clean and in proper adjustment cannot be over-emphasized. A few minutes spent in the field at the beginning of the harvesting season, or as often as necessary in adjusting the harvesting equipment, has proved to give big dividends in reduced field loss, increased efficiency and has resulted in top grades at the gin. Keeping the machine clean is of vital importance also. A daily washdown of pickers and strippers to remove grease, dirt and twisted-up lint is of great benefit in obtaining top grades. Many farm operators permit their machines to become so clogged with foreign material that proper operation is impossible. The damage to the cotton fiber by harvesting with machines in this condition is sometimes impossible for the gins to correct.

A daily washdown of machines with clear water is recommended and a weekly clean-up and maintenance check is most desirable. Indications are that periodic maintenance checks and repairs maintain the life of the equipment, increase the harvesting efficiency and reduce repair bills to a minimum. No special equipment is needed for this operation. An ordinary cattle sprayer, which will provide 400 to 600 pounds per square inch pressure on the hose nozzle, is sufficient to do an adequate job. By using high pressure, it is possible to remove grease and dirt and lint without resorting to costly solvents and undue labor.

• **Preserve Cotton Quality**—The industrial revolution in cotton production in recent years has extended not only to the producer and the ginner, but also to cotton mills. This increase in mechanization has made it necessary to preserve the inherent qualities in the cotton we produce. To assist in maintaining quality, the importance of proper handling after harvesting cannot be over-emphasized.

Good trailers are of utmost importance. The use of small two-wheel trailers to transport cotton to the gin is definitely detrimental for several reasons. First, in order to transport a bale, the cotton must be heavily tramped or packed into the trailer. By the time this cotton stays on the gin yard a few hours it begins to sweat and heat. The bottom layers turn yellow and become sticky and gummy from overheating. Cotton in this condition is extremely difficult for ginners to process and usually results in a two-sided bale.

Tramping also grinds into the lint any large dry leaf particles which might otherwise have been easily removed. This leaf trash results in fine pin and pepper trash which is extremely difficult for even today's modern gin plants to eliminate. If there is any green leaf present, green leaf stain may result and the reduction in grade is tremendous.

Losses from packing cotton in small trailers can range as high as from $5 to $20 per bale. Obviously, this loss could be turned into investment for good trailers which will hold a bale of cotton adequately without packing. Undoubtedly this is not the whole story. The ginner is affected, too. Small two-wheel trailers require additional labor on the gin yard, to get the trailers under the suction. It takes approximately twice as long to gin a load of heavily tramped cotton as one which has been hauled in loose. Many times it requires an additional hand in the trailer with a pick to loosen the cotton so the suction hand can get it and run it in the gin. All of this means added cost, poor service and strained relations between producer and ginner.

Slatted sides or wire-sided trailers are recommended over tight-sided trailers. Open spaces in the sides allow air to penetrate the load, distribute the moisture more uniformly and eliminate some of the heating and sweating when cotton has to stand in the trailer for extended periods. Obviously, the importance of keeping cotton clean and dry is many times forgotten. The cleaner, drier and fluffier that cotton can be carried to the gin, the better the sample.

• **Follow the Four-Point Program**—The four points that have become known as the Extension Four-Point Program for Better Ginning were developed to aid in an educational way the promotion of improved conditions in the operation of the cotton ginning industry. We believe that these four points, if practiced by every gin operator, will achieve the goal for which they were intended. These points are operations that every ginner will practice if he is interested in better ginning. They follow:

• **1. Maintain Uniform, Loose Rolls** — Maintaining loose rolls gives better grades and higher income. Loose rolls also mean a reduction in cost for the ginner because they reduce power consumption.

• **2. Keep the Over-Flow to a Minimum** —The over-flow cotton should by-pass all overhead machinery because redrying and recleaning often cause two-sided bales and fiber damage. Over-flow cotton means, ordinarily, that the stands are not being fed uniformly, resulting in poor ginning.

• **3. Use Only Necessary Cleaning** — Since most gins have valves and by-passes which allow selection of required cleaning equipment and drying equipment, operators should learn the advantages of using various combinations of machines in ginning and then take care to utilize the machines properly. Rough or machine-harvested cotton may require the use of 12 to 22 cylinders of cleaning, plus extractors. Clean, hand-picked cotton should be handled carefully and with less equipment.

• **4. Use Only Enough Drying** — The purpose of drying cotton in the gin is two-fold. First, drying aids in cleaning cotton. Second, it is an aid to smoother ginning. Green, damp or dew-laden cotton requires drying only for smooth preparation. Mid-season, trashy or machine-harvested cotton may require extra drying for better cleaning. Late season, roughly-harvested, weather-damaged cotton can stand more drying than earlier premium cottons. Obviously then, the net values from drying should be measured in terms of both grade benefits and weight losses. Planning, maintenance and repair are basic to efficient operation in today's gin plant.

By following the 10 rules of good harvesting, handling and ginning, the cotton industry can maintain top grades and produce quality cotton, reduce labor costs and increase profits. All of these things are necessary to maintain our competitive position and produce quality products for which there will be an increasing demand.

Heads Memphis Board

DIXON JORDAN is the 1955 president of Memphis Board of Trade. His election was reported earlier in The Press. President of Standard Commission Co., he succeeded Lee D. Canterbury of Cargill, Inc., as head of the Board. Fred C. Lovitt, partner in L. B. Lovitt & Co., is vice-president of the Board.

Cotton Output Is Rising In French Cameroons

In the French Cameroons local varieties of cotton have long been grown to supply local needs, but now the government and French industry are encouraging increased production.

Under this program output has risen from about 500 tons of unginned cotton in 1950 to 10,000 tons in 1953.

A gin with a capacity of 4,500 tons was installed at Kaele in 1953, USDA reports, and another one is being built at Garoua. An oil mill, capable of handling about 10,000 tons of seed per year, is also being erected at Kaele.

Drouth Relief Deadline

Feb. 15 is the deadline for new applications for feed assistance under the drouth programs, USDA has announced. This is in line with the policy of bringing emergency feed programs to an end as spring pastures are available. The Department says that if acute drouth conditions continue in any area, state committees are expected to request continued assistance.

Soil Fertility

(Continued from Page 20)

bales—2,112 pounds of lint—an acre!

Let's see how closely he followed the recommendations listed earlier. Here is what Coleman did, with a figure in parenthesis in each case referring to the number of the recommendation in our previous listing.

In late 1953, Coleman pulverized the plow sole of the five-acre field to a depth of 8 to 10 inches. (Recommendation No. 1).

He fertilized this field very heavily, following the recommendations of the Mississippi Experiment Station (6).

On April 10 (4), the Yazoo County grower planted mechanically delinted breeder seed (2).

Coleman made 17 applications of insecticides: he tractor-sprayed toxaphene three times and dusted 3-5-40 and dieldrin by airplane the remaining 14 times (7).

Having sufficient natural moisture until mid-summer, Coleman made only two water applications, each of two inches. They were applied by the furrow method, an old auto engine supplying the power to a second-hand pump.

Hand harvesting commenced Oct. 1 (10).

Here is science applied! And the results speak for themselves.

Co-sharers in the Mississippi cotton crown were the Pruett brothers of Clarksdale. Splitting honors with Coleman, they raised 2,072 pounds of lint per acre or 4.14 bales. The Pruetts' production practices were about the same as Coleman's.

(When final results of the two top-placing contestants were tabulated, the records showed that while Coleman's irrigation costs were $10 an acre, the Pruetts' irrigation costs were only $7.77 per acre.)

Had the Pruetts or Thomas Coleman cut out any one of their prize-winning production practices, their yields would have been lower, of course. But the one recommended practice they could least afford to drop, the one which meant the difference between an average crop and a superior one, was heavy—and proper—fertilization.

Remember these words of a Midwestern agronomist: **It costs almost as much to grow and harvest a puny crop as it does to produce a bumper crop. Fertility is the key to profitable farming.**

A proper fertility level means one thing to one farmer, something entirely different to another. That's why crops and soils specialists of the state colleges, the federal government, and private agencies, working independently or together, come up with such recommendations as those at the beginning of this article.

To insure proper fertilization of any plant, crop, field, or farm, a diagnosis of the soil medium is a necessity.

If a child is underweight for his age, he's a case for a doctor who recommends a certain diet to build him up. If a purebred cow gives only three pounds of milk a day right after freshening, the veterinarian tells you what you must do to bring her back into production. If Farmer "A" grows a quarter of a bale of cotton an acre while his neighbor, Farmer "B", grows three bales, then "A" needs a diagnosis of his soils and methods.

A farm is a factory, soil the assembly line, the farmer is the foreman, and the agronomist is an efficiency expert.

Soil testing, "assembly line analysis," then, is a must. The "efficiency experts" maintain laboratories expressly for these analyses. A comprehensive report of what soil lacks is the first step toward proper fertilization and higher yields. Remember, too, that an incorrectly collected soil sample is worse than no sample at all: county agents should be consulted for sampling methods.

Once the analysis is returned, these steps should be followed without fail:

1. Pay strict heed to the recommended recipe.
2. Time fertilizer applications.
3. Place fertilizer where the plants can reach it.

Some average increases in income per acre that college- and experiment-station-recommended use of fertilizer could bring Southern cotton growers are shown in Table 1.

It's all very well to recommend greater amounts of plant foods on cotton. But, you ask, how can farmers afford to invest in fertilizers when they are caught in a situation today where the costs of production are often greater than the prices they receive from the crop? The answer to that question is . . . farmers cannot afford **not** to invest in fertilizers.

Dollar for dollar, fertilizer is the best investment in agriculture today! Look at these figures: Fertilizer prices, in terms of plant food content, have advanced only 13 percent since 1935, but the price of all items farmers buy has risen 125 percent in the same period. In 1935, the average plant food content in a ton of fertilizer was 18.6 percent. Today it averages about 25 percent.

No article of this nature would be complete if it didn't contain some mention of cotton surpluses and acreage allotments.

When acreages producing cotton—or corn or wheat, those crops which are responsible for a great many of the farm surplus headaches—are taken out of production and sown to "non-surplus" crops, it is naturally assumed there will be a resulting decrease in net income. **Yet, if commercial fertilizers were used according to experiment station and state college recommendations, there would be little or no reduction in net farm income.**

Sound strange? Well, here are the facts from a study by the Arkansas Experiment Station. Arkansas cotton farmers could realize as much net profit from a 900,000-bale crop as from a 1,800,000-bale crop if they used fertilizer according to Experiment Station recommendations. Furthermore, they could produce that smaller crop on less than half the acreage. By using recommended rates of plant foods, the yield per acre would be substantially increased, the cost of producing each cotton bale greatly reduced.

Some recent experiments in California showed that the cost of producing a pound of lint could be reduced from 9.5 to 7.9 cents, the average net profit per acre increased from $186 to $261 if fertilizers were used at optimum rates on irrigated land.

Specialists at Clemson College indicate that South Carolina cotton growers' profits from a 400,000-bale crop could be 22 percent higher than the estimated $18 million profit from the 695,000 bales produced in 1953 in that state. To accomplish this, yield per acre would have to be increased from 283 to 500 pounds of lint. At the same time, cotton acreage would be cut by 64 percent! Higher plant food usage, recommended fertilizer usage, would be the indispensable tool to reach this goal.

If all cotton growers used the optimum amounts of fertilizers in producing their crop, they could afford to reduce their production from the recent average of 15 million bales to about nine million (which is more in line with domestic market demands) . . . and do this without reducing their net profit.

Table 1.—Possible average increases in income per acre through using recommended amounts of fertilizer.

State	Amount of fertilizer — grew — Amount of lint		Possible extra income per acre with recommended fertilizer applications
Georgia	Used: 325 lbs.	242 lbs.	
	Recommended: 700 lbs.	500 lbs.	$60
Louisiana	Used: 150 lbs.	404 lbs.	
	Recommended: 600 lbs.	600 lbs.	$29
S. Carolina	Used: 550 lbs.	275 lbs.	
	Recommended 800 lbs.	500 lbs.	$56
Tennessee	Used: 250 lbs.	340 lbs.	
	Recommended: 500 lbs.	500 lbs.	$30

• Dasheen Is Possible Crop for South

LOOKING for a new crop? Have you thought about the dasheen? USDA has issued a circular on this tropical root crop. The dasheen is an ancient food plant, resembling the elephants-ear. It produces edible corms and tubers similar to potatoes.

Dasheens have been cultivated in the Orient and the Pacific Island for 2,000 years, and they have been grown commercially in the U.S. since 1913, mostly in northeast Florida.

The dasheen, USDA says, is limited to lands that are comparatively low on the Coastal Plain—from South Carolina to East Texas—although it can also be grown in parts of California.

Dasheens may weigh up to eight pounds. Tasty, low-fat dasheen chips, resembling potato chips, are on the market. A single free copy of the USDA material may be obtained from the Office of Information, USDA, Washington 25, D.C.

Soybeans Recommended On Leftover Acres

Soybeans are a good companion crop for cotton, says W. R. Thompson, Mississippi Extension agronomist.

With the drastic cut in cotton acreage this year, many farms are going to have plenty of good land left after planting their cotton acreage allotment.

Soybeans can be planted after cotton planting time. The best soybean planting times in Mississippi are April 25 to May 25, Thompson said. Soybeans are mechanically harvested and do not present a great labor problem.

Disease Resistance

(Continued from Page 32)

ance. This variation in the proportion of wilted and healthy plants in segregating populations was confusing.

After the nematode factor was recognized and was eliminated by soil fumigation, results were quite uniform and the mode of inheritance of Fusarium resistance has now been worked out. According to Smith, resistance to Fusarium wilt in upland cotton is governed by a single dominant factor; but in Sea Island two factors seem to be involved. Efforts are being made to transfer the factors from Sea Island to upland so as to raise the level of resistance in the uplands. Perhaps, if this can be successfully done, the level of resistance will be sufficiently high to prevent the development of wilt even in the presence of nematodes.

In addition to Fusarium resistance, the inheritance of nematode resistance is being studied, and attempts are being made to incorporate resistance to both nematodes and Fusarium in basic breeding stocks. Parental material for improving nematode resistance is available in wild cottons introduced from Mexico and in other recently discovered sources of resistance.

• **Bacterial Blight** — Bacterial blight resistance has been available in an upland background since 1942 when Simpson released the resistant Stoneville 20 variety. The mode of inheritance of resistance to bacterial blight has been studied and resistance has been transferred to numerous locally-adapted varieties. Resistance is believed to be recessive; however, there appear to be minor genes for resistance, the level of which varies between varieties.

It is true that, from the standpoint of fiber quality, Stoneville 20 has little to offer. But by using the backcross technique, resistance has been transferred from Stoneville 20 and the desirable agronomic characters largely regained from the recurrent parents. We have hoped that the cotton breeders would see fit to utilize this available material so that the new varieties being released would carry resistance to bacterial blight. Progress is now being made in this direction, and it is hoped that even greater use of the material will be made in the future.

An apparently different strain of the blight organism appeared in several widely separated localities during the past two years. The Stoneville 20 type of resistance is no longer adequate where the new strain occurs, but fortunately there is a source of resistance to both the normal and the new strain of blight. This resistance is carried in an Acala selection made by Doctor Blank at State College, N.M. This selection has been increased and small amounts of seed are available for use by any who wish to include it in their breeding program.

• **Verticillium Wilt Work**—Verticillium wilt is a relatively new and very destructive disease of cotton. Workers have not as yet enjoyed the success in obtaining resistance to Verticillium that has been the case with Fusarium wilt and bacterial blight. However, considerable tolerance to the disease has been found, and the breeding program is being pushed as vigorously as possible in transferring this tolerance to locally adapted varieites. Attempts are being made to pyramid resistance by crossing tolerant selections and the search is continuing for new sources of resistance.

In California, Harrison has developed a high degree of tolerance in Acala 4-42 and in the Hopi Acala crosses. A fair degree of tolerance has been obtained in certain inbred lines of Empire, Auburn, Plains, and Hartsville. Empire, Auburn, and Plains are also resistant to Fusarium wilt, which is of considerable importance in the Southeast where both wilts are present.

At the present time there is nothing more to offer in the upland varieties than a certain degree of tolerance which has been developed through selection within varieties. Future advances in tolerance or resistance will come through a crossing program. Sea Island and other Barbadense varieties have a high degree of resistance. Sea Island is practically immune, and it may be necessary to begin a long range breeding program to bring this resistance over to the upland varieties.

• **In Summary** — Fusarium resistant varieties are available; progress is being made in transferring a higher level of resistance from Sea Island to upland stocks; the Fusarium nematode complex is being studied and tolerance to the root-knot nematode has been found in certain introductions of wild cottons and cotton relatives. The Stoneville 20 type of blight resistance has been transferred to many commercial varieties of upland cotton and through backcrosses most of the desirable characters of the recurrent parents have been regained. An Acala selection which is resistant to the new strain of the blight organism is being used in the blight breeding program. A certain degree of tolerance to Verticillium wilt has been developed in Acala 4-42, Hopi-Acala and certain of the Western varietal group. Tolerance has also been found in certain of the Southeastern Fusarium resistant varieties. Higher levels of tolerance or resistance apparently can only be obtained from wide crosses.

Disease losses could undoubtedly be reduced if there were a more general awareness of the disease problems and if greater use were made of available resistant stocks by the breeders in developing new varieties. The heavy toll taken by the various diseases is clearly illustrated in the disease loss estimates compiled by Dr. Philip J. Leyendecker in cooperation with the Cotton Disease Council[1] (Table 1).

It is something of a commentary on our cotton improvement program that all of the varieties commonly grown in the Southeast do not possess resistance to Fusarium wilt. The most reliable estimates that we have indicate that there is an average loss from Fusarium of about 200,000 bales per year. In 1954 the loss was 191,500 bales. These losses occur in the Southeast every year where Fusarium wilt is widely prevalent; and as we have shown, has been prevalent since before the turn of the century. It is my honest opinion that this loss could be reduced by at least 50 percent if only Fusarium resistance varieties were grown where wilt is prevalent.

The current trend toward supplemental irrigation and complete mechanization is creating changes in the agricultural pattern of the Cotton Belt. These changes will undoubtedly bring new disease problems and will impinge on other areas of cotton research. It is imperative that we recognize the problems now and orient all phases of the cotton research program accordingly if we are to meet the challenge.

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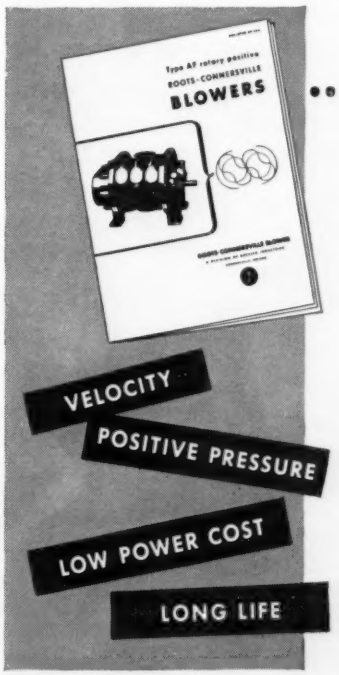
[1] Doctor Leyendecker is Head of the Agricultural Services Department, New Mexico A. & M. College, State College, N. M.

■ **GEORGE A. BRADLEY and AHMED A. KATTAN have been named assistant professors at the Arkansas Experiment Station, where they will study the effects of irrigation on plant physiology.**



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Culture for King

(Continued from Page 16)

ly adjusted for spacing by the line-diagram method.

Planting and Thinning

Planting time is the most trying time of the cotton farmer's year. He realizes that he has a limited period to get the crop planted and up, and he frequently plants too early and too much seed in an effort to hedge. Carefully planned and executed preplanting operations, good planting seed, a warm seedbed, and close supervision of the planting operation usually result in satisfactory stands.

Cotton farmers are sometimes accused of planting early in order to have time for one or two replantings. Modern multiple-row planters, improved insect control throughout the season, and current varieties all make it possible to begin planting later in the season than was possible 10 years ago or even five years ago. The seed dealer is the only man who stands to profit from early planting, and even he is not too happy because a poor stand is bad advertising for his product.

Whether cotton is hill-dropped or drilled is pretty much a matter of personal preference. Hill-dropping is slower than drilling but costs less to thin and requires substantially less seed. Drilling is faster, requires more seed, but the crop can be cross-cultivated if desired.

The cultivator-planter combination offers several advantages and a real saving in labor and equipment. Using this method eliminates the need for disking and dragging the beds prior to planting. The cultivator loosens the bed so the planter sweeps off loose soil and deposits seed in a firm, moist bed. This method makes extremely uniform rows possible, resulting in more efficient cultivation throughout the season.

Before the boll weevil spread across the South, standard spacing for cotton was four by four or five by five feet. The boll weevil, use of heavier rates of fertilizer, and the desirability of reduced stalk size for mechanical harvesting have resulted in a shift to higher plant populations. Spacing experiments throughout the Cotton Belt have shown that plant populations between 20,000 and 50,000 plants per acre show small differences in yield.

Every spring some planters must decide whether or not to thin hill-dropped, cross-plowed, or hand-blocked cotton. A recent series of experiments at the Delta Station, in which hills were hand-thinned to specified numbers of plants, revealed that there were no significant differences in yields between plots varying from three to 20 plants per hill in cotton cross-plowed on 40-inch centers. In cotton hill-dropped on 18-inch centers, two to 12 plants per hill gave no significant yield differences.

A few plants become dominant in heavily populated hills and suppress less vigorous ones. Unless stands average more than the maximum figures cited above and unless labor is plentiful and cheap, reducing the number of plants per hill will probably not be profitable.

Countless machines have been developed for thinning cotton. Under ideal conditions, some of these devices perform satisfactorily. Usually, mechanical choppers can be used for only one trip over the field.

Generally, cotton farmers are inclined to plant too much seed. Uniform stands are essential for maximum yields; however, heavy rates of seeding cannot compensate for poor preplanting preparation nor for unfavorable climatic conditions. Planting 20 pounds of mechanically delinted seed per acre, hill-dropped on 16-inch centers, has produced excellent stands.

Cultivation

The objectives of cultivation are weed control and breaking the crust on the surface of the land. Unless one or both of these objectives are being accomplished, cultivation is unnecessary. After the crop is up, cotton farmers might well adopt the war-time slogan: "Is this trip necessary?"

Rotary hoes mounted on the cultivator, over the row, do an excellent job of controlling small weeds as cotton is emerging and soon after it is up. Where chemicals for weed control have been applied pre-emergence, rotary hoes should not be used, as the tines puncture the treated band and permit weeds to emerge.

Shallow, high-speed cultivation has been shown to be most efficient in cotton. Excellent flat, high-speed sweeps are on the market. If set properly, these tools control weeds and require no sharpening.

Care should be taken to prevent throwing fresh soil onto the drill row. The importance of this point is too frequently overlooked by the cotton producer. Seed of some of our most troublesome weeds require light for germination. Custom and tradition to the contrary, "dirting" cotton, except in dry farming, is a rapid means of planting weed seed in the drill and inviting trouble.

Cross-plowing is a method of cotton culture which offers possibilities for reducing production costs. Like any good practice, cross-plowing, or cross-cultivation has limitations. Except on level land, this practice should not be considered. Unless the initial drilled stand is good to excellent, cross-plowing may reduce yields. Emergence sufficient to give a uniform cross-plowed stand of at least three plants per hill is satisfactory. Cross-plowing tends to reduce mechanical picker efficiency; however, the saving in cost of weed control more than offsets this minor loss.

Flame cultivation can be used to control weeds after stems of the cotton plants have become tough enough to withstand the flame. Generally, this practice can be applied when the stems are approximately three-sixteenth inch at the ground line. Flame cultivation is probably the cheapest means of controlling small weeds in the drill or hill. It is not adapted to early weed control and will not control large weeds.

Late weed control in cotton has become extremely important with the use of mechanical pickers. To date there is no completely satisfactory method for controlling weeds late in the season. Summer fallow for the control of Johnson grass and a good job of weed control through the period of cultivation will reduce the late weed problem. Some of the new chemicals for killing Johnson grass offer possibilities as spot applications.

No weed control program can be successful unless the yearly crop of weed seed is reduced. A number of common weeds produce in excess of 5,000 seed per plant, and seed of many of these pests remain viable for 25 to 40 years. The importance of controlling the weed seed crop cannot be overemphasized.

Efficiency in crop production, like efficiency in industry, is measured by the unit cost of the product. In crop production, efficiency can be increased by increasing per-acre yields and through wise use of machines and labor. Applying the findings of research and knowing that each trip with an implement is contributing to increasing the quantity or improving the quality of the product are the ways to more efficient production of cotton.

■ Brief . . . and to the Point

THERE IS a need for better understanding of farmers' problems on the part of the consumer, Buford Ellington, Tennessee Commissioner of Agriculture, told the Southern Farm Forum meeting in New Orleans Jan. 27.

> There is a constant demand for quality products, and the consumer expects his product to be "dressed up." This brings about a misunderstanding on the part of the consumer as to the farmer's share of the price of a product.
>
> Ellington pointed out, for example, that on a $5 shirt, the cotton farmer receives about 47 cents; for a 24-cent quart of milk, about 12 cents; and for a 19-cent loaf of bread, about four cents.

Tips on Ginning

(Continued from Page 70)

ers and the ginning laboratory in the refinement and development of improved practices and equipment for cleaning cotton, it appears that grades are declining slowly due largely to changes in harvesting practices. It appears that cotton is brought to the gin each year with a bit more foreign matter than can be offset by the improved machinery. For example, in California, where weather conditions are about as consistently favorable as in any other area of the Cotton Belt from year to year and where as much, or more, of the crop is harvested by machine than in any other state, the average grade is showing a consistent downward trend from an average of M- in 1946-47, to SLM in 1953-54[2]. The trend toward lower grades each year is also true for the Cotton Belt as a whole.

The ginning industry does not have the complete answer, through research, but the equipment now available to the ginner, when used properly, will make mechanical harvesting methods profitable. Further research should produce new and improved tools to help the ginner meet the problems now troubling him. This will not, however, alter the fact that grades are made in the field by the farmer and preserved as nearly as possible by the gin. Good teamwork in production, harvesting, and ginning, using modern equipment and the best know-how, are required for turning out a quality bale of cotton mechanically.

[2] Cotton Quality Statistics U.S. 1946-47, and 1953-54. Cotton Division, AMS, USDA.

DAVE SHERRILL, left, Lubbock County Agent, who spearheaded drive to return cotton burs to soil, shows a student an attachment which sprays water on the burs. This device was built by Hub Beavers, a ginner of the area.

A program of using cotton burs on the land instead of burning them is paying handsome dividends for producers, ginners and crushers on the South Plains of Texas. Big advantage is better soil texture.

Lubbock County Bur Story

"WASTE NOT, want not," might well be the slogan of South Plains ginners and farmers who are using cotton burs—not destroying them.

Returning cotton burs to the soil has brought many benefits to farmers in the area, since Dave Sherrill, Lubbock, Texas, county agent, started pushing hard on the idea in 1951.

For one thing, the fire hazard on the gin premises is reduced. And for the farmer, burs provide badly-needed organic matter for South Plains soils, giving better water penetration and soil texture, and serving as protection from wind erosion. Burs have proved useful as fertilizer, too.

• **The People Make the Story**—A big part of any drama is the cast of characters, and the stars of the Lubbock County Bur Story are Dave Sherrill, the county agent who "sold" the idea, and the farmers, ginners, oil mill men and others in the area who got behind the bur-returning program to such an extent that in 1954 burs actually had to be rationed.

Sherrill was given a silver dinner bell by Texas Cottonseed Crushers' Association in 1953 in recognition of his part in this important program.

Here are the high points of the story:

• **Humus Up in Smoke**—Before 1951, an average 70,000 tons of cotton burs were burned annually—70,000 tons of potential soil-building, profit-making humus for South Plains farmers. Fire was then considered the cheapest and easiest way to dispose of the unwanted trash around gins.

Then County Agent Sherrill, and Roy Davis, manager of the Plains Co-operative Oil Mill in Lubbock, started to study the possibilities of returning burs to the land in the South Plains area.

They went to work in 1951, first asking Texas Commissioner of Agriculture John C. White to clear the way, by ruling that raw burs could be returned to the soil. (The area then had only a light infestation of pink bollworm, but was under pink bollworm regulations.) This permission was granted. And in 1951, about 18 percent of the raw burs in the South Plains area went back to the land or were used as cattle feed.

A mere four years later—and in the face of tighter pink bollworm regulations—an estimated 75 percent of the burs were returned, thus attesting to the value of the practice.

• **Some Experimental Results**—At Paymaster Cotton Breeding Farm, Aiken, Texas, Harold Loden and Bob Gibson, report that cotton burs applied at the rate of eight tons per acre made soil yield 1½ bales of cotton per acre in 1953, compared with only one bale for cotton on untreated land.

At the Lubbock Experiment Substation, two tons of burs applied in the fall of 1952 were given credit for an increase of 43 pounds of lint per acre over check plots.

Water penetration was two to three times greater on land which had been treated with burs than where no burs were applied in experiments at the Spur Experiment Substation.

At the Oklahoma Experiment Station, tests have been going on for a 24-year period. They show that plowing under three tons of burs every third year increases average annual seed cotton production by one-fifth.

G. C. Rook, an independent chemist, has done comparisons of fertilizer values

Shown below are two plots of rye grown at the Sandy Land Experiment Station, Mangum, Okla. The crop at left was treated with 50 tons of cotton burs per acre; check plot at right had no burs applied.

of bur mold and barnyard manure. The following table shows that burs compare favorably with manure.

Comparative Fertilizer Values of Bur Mold and Barnyard Manure*

Elements	Percent Available	Pounds Per Ton
Bur Mold		
Nitrogen	1.5	30
Phosphate (P205)	.395	7.9
Potash (K20)	5.076	101.52
Barnyard Manure		
Nitrogen	.5	10
Phosphate (P205)	.3	6
Potash (K20)	.4	8

*After 12 months of exposure.

• **Ginners Quick To Help**—As the idea caught on, South Plains ginners began to build special loaders for burs, switching them from the burning stacks to the loaders as long as farmers wanted burs.

In 1953, when pink bollworm regulations had to be tightened, either hammermilling or composting of gin trash was required before movement to the farms. This did not dampen the enthusiasm of Lubbock County ginners, Sherrill says, as more than half of them complied with the regulations that year in order to make the burs available to the farmers; and by 1954, 33 of the county's 40 gins were set up, either by composting, hammermilling, or by a system of dual fans, to provide farmers with pink bollworm-free cotton burs.

• **A Gin in Action**—Early advocates of returning burs to the land included board members of the Acuff Cooperative Gin at Acuff. Under the management of Charlie Hunter, the gin went a step farther than just making the burs available: It rigged up a truckbed for spreading burs on the land, and offered this service to gin patrons. In 1952 over 50 farmers availed themselves of this service.

The truck was remodeled for bur spreading at a cost of $1,100. It is loaded at the gin from overhead hoppers. Acuff Co-op has two of these hoppers, each costing $800, and in 1953 a hammermill was installed at a cost of $800.

This investment in bur-returning equipment totals $3,500 since 1952, and Manager Charlie Hunter says that in three years of operation the equipment has paid for itself and taken care of current operating expenses.

About $1,300 worth of ginning came back to the gin from increased yields the first year after burs were worked into the soil, he says.

The co-op started out charging farmers $1.50 a ton for the burs (spread on the ground). When the hammermilling equipment was added to the plant, this was raised to $2.50.

A hammermill was installed at each unit near the overhead hopper. A two-inch mesh screen was used. A 25 horsepower electric motor powers the hammermill, over which is a sheet iron building.

The Acuff bur spreader has numerous sprockets and chains that operate steel slats along the floor, moving the burs from the bottom of the load unto a revolving cylinder with spikes that push the burs out in a steady flow adjusted either at the rate of two tons or four tons per acre. The body of the truck is steel reinforced corrugated iron. The spreader cylinder is 90 inches wide, covering three rows at a time.

(Blueprints of the spreader are available from Ed Bush, cotton ginning specialist, Texas Extension Service, College Station.)

• **How About Your Gin?** — Sherrill makes the following suggestions for setting up a program of returning burs to the soil:

"Determine if there is enough need for organic matter in soils. Is water penetration a problem? Is evaporation great? What are the regulations in the area pertaining to the return of cotton burs to the land?

"Get together with farmers to discuss losses from burning and the need for cotton burs on the land. Arouse interest in building up the soil. Get pilot demonstrations. Leave check plot. Try out more than one year. Keep the public informed. Include 'burred' ground and crops in farm tours. Talk cotton burs on radio and television."

Sherrill emphasizes that a good cotton crop needs land in peak condition each year. Organic matter and humus are two of the most important factors in soil conditioning and fertility. They must be returned to the soil every time they are taken out in the form of cotton. Burs can help do this job.

Henry Heck, Heckville ginner, who composted burs last year and hauled them to customers' farms at cost, says that he hopes he is never required to burn another bur—burning is truly a "monument to waste," he comments.

Make Irrigation Plans Early, Expert Says

Farmers should make their plans early if they want to irrigate 1955 summer crops, says A. M. Pettis, Florida Extension assistant agricultural engineer. He points out that, to be profitable, irrigation water must be applied just when needed; but that it takes advance planning and purchasing to be ready to apply the water at that time.

Dry weather of recent years has convinced many farmers that an irrigation system is necessary if they are to stay in business. Farmers who have reached this decision, Pettis declares, should act now to get the system ready for use when needed.

Presenting

W. C. Painter

Fort Worth, Texas

W. C. PAINTER, Fort Worth, Texas, is manager of the Swift & Co. Oil Mill there. He was born in Coryell County near Gatesville, July 6, 1891.

He began work with Swift & Co. in the Gatesville office in 1910, and after three years there he was transferred to the Temple mill.

In 1914 Painter moved to Fort Worth. He was cashier at the mill there for four years. In 1918 he became assistant manager, and in 1924 he was named manager.

Painter is a member of Moslah Temple Shrine, Rotary International and the Fort Worth Club.

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Industry Owes Him Much

Father of Cotton Fiber Technology in USDA

■ WORK of Dr. Robert W. Webb has added millions of dollars to the income of cotton growers, ginners and spinners in the 28 years since he became interested in fiber research.

By FRED BAILEY

Washington Representative
The Cotton Gin and Oil Mill Press

HAVE YOU ever cussed the "government" and damned the "bureaucrats"? If not, this article probably will not interest you and we suggest you simply turn the page.

But, if you are among the great majority of us who have exercised that greatly prized privilege of "telling off" Washington, we suggest that you read on, for here is a story of a man you may want to applaud.

In the cotton industry we probably owe Dr. Robert W. Webb many times the amount we have paid him as a government worker in the past one-third of a century. His work has added millions of dollars to the income of cotton growers, ginners and spinners.

Often called the "father of cotton fiber technology in the USDA," it was by birth and chance that Doctor Webb became interested in cotton fiber research 28 years ago, come next March. Under various titles and departments since 1927 he has headed cotton fiber research in USDA.

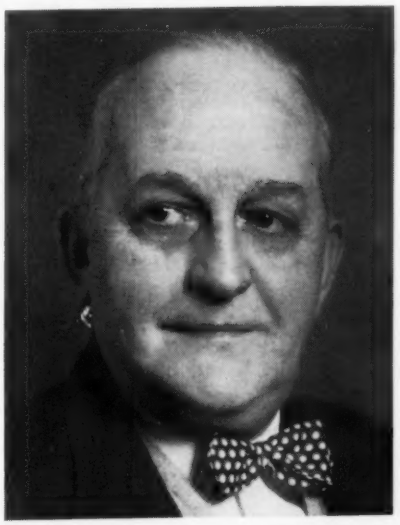
Born and raised in South Carolina, Doctor Webb learned about cotton production early in life from a practical standpoint. After graduating from Clemson College and Washington University, he joined the Department in June 1921.

Six years later, while he was engaged in plant pathology work on wheat, Arthur W. Palmer, now in charge of the Cotton Marketing Division, asked him if he would be interested in working on cotton fibers, a field then largely ignored by the Department.

Doctor Webb replied that he felt the future of Southern agriculture depended in a considerable measure on improving and finding new uses for cotton and that he would like to work on that. So little was known about cotton fiber that Doctor Webb and his staff spent the next two years searching out all that was known. Most of that time was spent in the Library of Congress.

He established the first modern cotton fiber research and testing laboratory in the U.S. and the third in the world. Two earlier ones were established in England. Today there are more than 125 government and private laboratories devoted to the study of cotton fiber properties.

Doctor Webb has been far more than just a pioneer in this field; he has been and is a leader and one of the principal contributors to the science of measuring the properties of cotton fiber. He has received many awards, the latest of which was a certificate of merit at the cotton industry Spinner - Breeder Conference held last October in Greenville, Miss., in "recognition of outstanding contributions to the development of scientific knowledge connected with the definitions and relationships of fiber properties and spinning qualities."



DR. ROBERT W. WEBB

He is the inventor of the Suter-Webb Duplex machine now in common use for separating cotton fibers according to length. He developed and directed the first modern and comprehensive cotton-quality research program in the U.S., including cotton fiber, ginning and spinning studies.

Doctor Webb established the fiber technical basis which sparked Congressional authorization for the creation of the first cotton ginning laboratory in the U.S., in 1930, and for the successful development of the world's most comprehensive ginning research program.

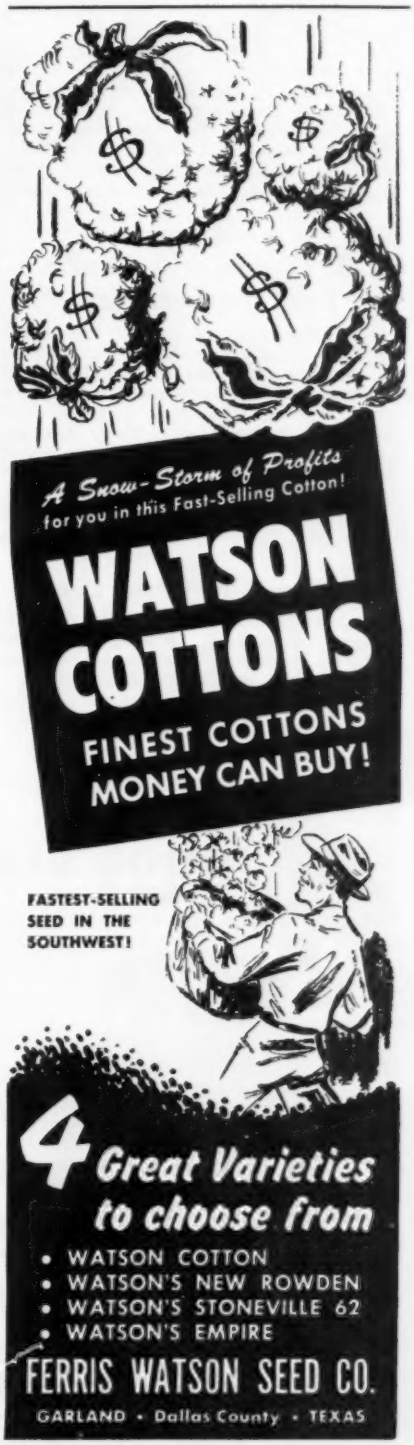
His findings in reference to cotton fiber fineness gave breeders in this country, as well as in others, a new target for use in their cotton breeding and improvement work. Those results have been a prime factor influencing the direction of future cotton breeding, improvement and production programs in the U.S. and elsewhere.

Information developed by Doctor Webb led to creation by Congress of a cotton testing service in the USDA in 1942. This made available cotton fiber and spinning tests on a fee-per-sample basis. Associates say this service has made possible rapid and positive improvement in the quality of the American crop, and that still more progress may be expected in the future.

In the past 28 years, Doctor Webb and his staff have trained and supervised hundreds of staff members in cotton fiber technology. In most of the more than 125 laboratories mentioned above there are men trained by Doctor Webb.

The work of Doctor Webb over the past more than a quarter of a century has not been blazoned in headlines, but it has contributed solid advancement to one of our most important national industries, the growing, processing and spinning of cotton fiber.

The unsung story of Doctor Webb is not an exceptional one. It is duplicated, more or less, by many thousands of honest, hard-working and intelligent public servants who go quietly about doing their jobs.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• Irrigation Is Help But Not Cure-All

IRRIGATION that provides ample water can solve the drouth problem, but it's not a cure-all for poor crops, University of Tennessee engineers warn. Irrigation, in other words, is most likely to pay off if it is considered as a final step in a complete soil and water management program.

There is no doubt, it was pointed out, as to the value of an irrigation system. But to regard it as a sort of crop insurance may lead to disappointments. It would be wise to talk it over first with the county agent, or other competent adviser.

It is true that irrigation can bring about spectacular increases in yields where water is the chief factor in limiting crops. The big thing is to consider the importance of irrigation where soil conditions and good farming practices would make for profitable farming in crop years when there is adequate rainfall.

Meal, Cactus and Alfalfa Hay Used To Feed Ewes

When supplemented with cottonseed meal and alfalfa hay, burned and chopped prickly pear made a satisfactory emergency ration for ewes in a 213-day drylot feeding trial at the Texas Experiment Substation at Sonora. A number of emergency rations were tried for ewes, and research workers concluded that the price factor and convenience of feeding should be considered in determining the ration to use.

More Protein, More Lean

More protein in the ration of pigs results in leaner pork, Iowa State College research indicates. Dr. Damon Catron and Joseph Kastelie reported that the amount of lean in carcasses was higher when the feeding level of protein increased.

Pond May Be Better Than Well in Georgia Area

Lakes and ponds may be a more dependable source of irrigation water than wells in Georgia's Piedmont area, according to Willis Huston, Georgia Extension irrigation specialist.

"A four- to six-inch well 400 to 500 feet deep may bring in only 25 to 75 gallons of water per minute," Huston said, "and that isn't enough to be of much value in irrigation."

With a well flowing 50 gallons per minute, it takes 10 hours to put an inch of water on an acre of land.

Huston admitted that some wells in the Piedmont section are bringing in enough water for irrigation, but he said that the geological formation of the soil is such that one well may do all right and another a few feet away won't produce a satisfactory supply.

"With wells costing $4 to $6 per foot for drilling," Huston explained, "it isn't worth the risk."

In Georgia's Coastal Plain section drilled wells are producing good results, he stated. Six-inch wells in that section get up to 350 gallons per minute. Numerous wells are being drilled for irrigation of tobacco and truck crops, and they provide a satisfactory source of water.

In the Piedmont, Huston suggested that farmers interested in irrigation consider lakes and ponds. The soils are such that ponds are satisfactory in most instances, he said, and the numerous hills, valleys, streams, and creeks make excellent pond sites.

Irrigation is expanding in Georgia, according to the specialist, and the Farmers Home Administration and banks are making soil and water conservation loans.

Association Moves Office

National Agricultural Chemicals Association moved its office on Feb. 1 to Suite 603-604, Associations Building, 1145 19th Street, N.W., Washington 6.

QUOTES FROM OUR AUTHORS

"By following the 10 rules of good harvesting, handling and ginning, the cotton industry can maintain top grades and produce quality cotton, reduce labor costs and increase profits. All of these things are necessary to maintain our competitive position and produce quality products for which there will be an increasing demand."—Fred C. Elliott and E. H. Bush.

• Principle of Water Use Is Outlined

LEGAL principles that apply to the use of irrigation water in Georgia have been summarized by Bryan Storey, University of Georgia, a member of the state's water use and conservation committee. While state laws vary somewhat, many of these principles apply generally.

Storey explained that of most interest and importance to farmers was the riparian rights doctrine found in two sections of the Georgia Code. Riparian rights apply to surface waters in creeks and rivers, in non-private lakes and ponds, and to waters flowing in well-defined underground streams.

He pointed out that, under the strict aspect of the riparian doctrine, the proprietor of riparian land (land containing or bordering on a watercourse or other body of water) is entitled to have the water flow by or through his land, undiminished in quantity and unimpaired in quality, except that he is entitled to take from the stream such water as he needs for domestic purposes. Domestic purposes include water for drinking and household purposes and water for the use of farm animals, he explained.

Storey said that if the stream is small, a riparian proprietor may consume all the water in it, if used for domestic purposes, without thereby incurring liability to lower proprietors.

As modified, the riparian doctrine permits each riparian proprietor to make reasonable use of the stream, but the right is limited by the fact that all other riparian proprietors have an equal right, he continued.

He said a problem arises in connection with the determination of what is a reasonable use. This depends upon all the surrounding circumstances, such as size of the stream, nature of use and amount of water taken, and the other uses to which the stream is adapted.

"The ultimate determination of whether a particular use is reasonable lies with the jury in an action at law," Storey commented. "What is reasonable one year may not be so the next, and as subsequent users come into the picture, it may be necessary, under existing law, to have made continuing reapportionment of the available supplies of water."

He concluded that the present Georgia law, which contains a large degree of uncertainty as to the rights and duties of the users of Georgia's water resources, should be strengthened as the present uncertainty discourages investment in beneficial water use.

4 GOOD REASONS FOR USING

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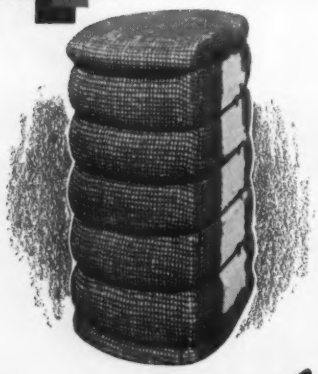

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In South Carolina Experiments

Water Is Key to Success

■ J. M. ELEAZER, Extension information specialist, describes what 1954 research at Clemson showed, and applies it to average farm, showing that it could have added $14,237 to income.

SUCCESS instead of failure! That's what irrigation experiments at Clemson College showed last year, J. M. Eleazer, South Carolina information specialist, said recently. Eleazer's comments on irrigation in South Carolina follow:

"Unirrigated cotton made 660 pounds of seed cotton per acre. The best irrigation practice made 2,150 pounds. Other results: Corn zero against 91 bushels per acre; soybeans 7.3 bushels against 32.7; common Bermuda grass hay .6 and 5 tons per acre respectively; pearl millet for hay .7 and 4.5 tons; and peaches 3.7 bushels per tree against 6 bushels of larger peaches where irrigated.

"Now let's apply these results to just an average size farm. Assume it had 20 acres of cotton, 30 of corn, 20 of soybeans, five of common Bermuda, five of pearl millet, and eight acres of peaches.

"Figuring cotton and the seed at $200 a bale, corn at $1.50 per bushel, soybeans at $2.50, the hay at $40 a ton, and peaches at $2 a bushel (the larger irrigated peaches would have surely brought more per bushel, but we will leave it at that), here is what we get:

"Without irrigation, the gross farm income from these crops would have been $8,399. With irrigation, it would have figured $23,636! Irrigation thus added $14,237!

"Now, folks, many a farm in the state would figure out that way for last year.

"No wonder I never cease to plug for irrigation. And no wonder Clemson is bending its every effort to find out when and how much for best results, and the extension engineers and county agents are kept busy surveying and advising farmers.

"As I've often said, irrigation costs something. Yes, but it costs more not to. If our farms had what they lost last year by not having it, they would be in the clear on irrigation costs for years to come.

"Every farmer without irrigation so often experiences the above. All drouths are not that bad. But we seldom make any crop from which drouth of short or long duration does not take its dreadful toll. Profits from irrigation do not have to be as great as those above in order for it to pay. Maybe it is a truck crop. One watering has made the difference between a good crop and a total failure at Clemson's Truck Station near Charleston. Or maybe it is corn. One good watering during a tasseling during a drouth at Clemson has increased the yield from 16 bushels of nubbins to 72 bushels of ears per acre.

"So many years are like last year. They come with promise. In May or June things look good. But all too often a summer drouth strikes. Soil fertility can't work. Crops wilt, parch, and burn into sorry resemblances of the plenty they promised early. Harvests are meager. Winter winds blow across bare fields and whistle through the cracks in empty barns. The farmer grows old with worry about unpaid bills and how he will pitch the coming crop.

"Yes, it's the old story. Drouths have kept us poor. They have skimmed the cream, and often left us empty handed. Will we continue to let 'em do it? We can't for long. Costs now are too high. Debts will get us. We must have a goodly harvest. And we know how to make it. Yes, IF WE GET THE WATER!

"Experience has abundantly shown that the needed life-giving water just does not usually come when you need it most. Solve that, and a greater abundance beckons from your fields."

Golden Agricultural Age Seen by Sociologist

The "golden age of agriculture" is seen by O. D. Duncan, head of rural sociology, Oklahoma A. & M. College, Stillwater.

Speaking before the national conference on rural education in Washington recently, Duncan told the group that one-fourth of our farms now produce three-fourths of the marketable farm products and that inefficient farms are being weeded out.

Inefficient operations will be consolidated into larger units and there will be an end of "an era under which this nation can no longer continue."

Out of this consolidation and upgraded efficiency there will come "the first golden age which agriculture has ever known; a prosperity the like of which the world at large has never seen," he says.

• Atom and Sex Prove Too Much for Pest

SCIENTISTS have successfully combined atomic energy and their knowledge of the creatures' sex habits to wipe out screw worms on the Caribbean island of Curacao. USDA officials describe the research as a milestone in entomological warfare on serious pests. They say that it proves the effectiveness of an entirely new idea in insect control.

Entomologists exploited the natural fact that the female screw worm fly mates only once. Starting from that point, they saturated the wild population with thousands of laboratory-bred flies made sterile by exposure to gamma rays from radioactive cobalt.

The radioactive material was supplied by the Atomic Energy Commission's huge Oak Ridge, Tenn., installation.

Officials explained that success of the Curacao campaign depended on how successful they were in infiltrating the local fly population with sterile males.

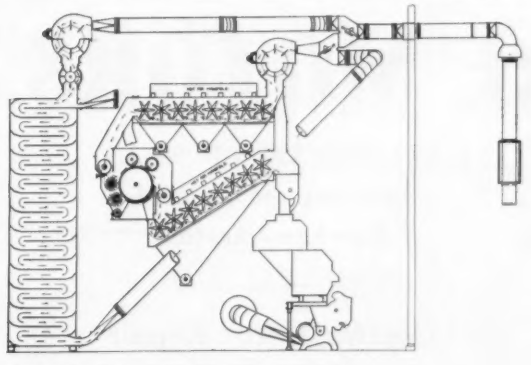
They started with the release of 52,000 laboratory-treated males by plane on last March 26. Thereafter the rate of release was 100 sterile males per week for each of the island's 170 square miles.

The rate was quadrupled last Aug. 1 after it was found that the original schedule was not speedy enough for eradication. Apparently, that did the trick.

Not a sign of the screw worm has been found on the island since last November. The experiment also was tried on Sanibel Island off the Florida coast but the comparatively short distance from the mainland resulted in re-infestation.

With U.S. livestock losses from the screw worm running to $20 million a year, officials believe it will be worthwhile to treat the entire Florida peninsula as an isolated infestation, just as was done on Curacao.

They say winter is the best time to strike, since cold weather pushes the screw worm's survival line deep into Florida.



Note the hot air on the cleaners is blown through the cotton by a series of nozzles (similar to the air blast nozzles on a gin stand), forcing the dirt, leaf trash and stems through the screen. Cleaners made in any number of cylinders to meet local conditions.

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• World Is Gradually Getting Hotter

"YES, the weather's changing," says the U.S. Weather Bureau. It's getting warmer.

But more important questions are how much and why?

It is an historic fact that violent temperature changes have taken place in past ages. The present polar regions once held tropical vegetation and animals; parts of the southern latitudes were once covered by ice. But these changes took tens of thousands of years.

"We can be sure that the year to year fluctuations of weather are much larger than the long-term trends," says H. E. Landsberg, chief of the Weather Bureau's climatic services division. During one person's lifetime, temperature changes are small, indeed, and rainfall deviations cannot even be validly analyzed, he says.

Meteorologists have been studying both temperature and rainfall records in an effort to establish general principles of weather.

There is evidence of a warm-up. During the 1930's it was relatively fast. Today it has slowed down a little, but there is no evidence of a reversal.

Out in the open country, present-day temperatures in the moderate latitudes of the northern hemisphere are about two degrees higher, on the average, than during the last two or three decades.

In the cities, the warm-up has been even more pronounced — being one or two degrees higher than in the open country. City dwellers are warmed not only by natural causes, but also by furnaces, motor vehicles, smoke, and the metabolism of other human beings in masses.

Going far afield into the marginal areas around the Arctic, researchers find that hardy plants and trees are making inroads on the ice. In Scandinavia, where careful observations have been made for the last half century, glaciers have shrunk as much as several thousand feet.

This warm-up has been the trend in climate since 1900. But it is often completely obscured by violent short-term changes — often as much as two degrees difference in temperature from year to year. Data are not yet complete enough for meteorologists to detect the meaning and causes of the short-term changes.

Rainfall is even more unpredictable. "In some regions it is not at all unusual to have in one year only two-thirds of the average rainfall and then to have 30 or even 50 percent more than average the following year," Landsberg says.

Analyzing the rainfall trend is like studying "the choppy seas tossed up by a hurricane," he reports. "In them the long swells and tides are not discernible. Thus while we can still disentangle temperature trends over a 30-year period, rainfall fluctuations from year to year are too large to permit discovery of trends within a human lifetime. Over periods of a century or more we can begin to get some ideas," he concludes.

Best Soybean Planting Time in South Given

Optimum planting date for soybeans in the South appears to be when the minimum soil temperature attains 65° F. and after the day length reaches or exceeds 14½ hours. This is the conclusion from research reported in USDA Circular No. 943 by Edgar E. Hartwig, U.S. Regional Soybean Laboratory, Stoneville, Miss.

Planting under such conditions will give more rapid emergence, more rapid growth, higher seed yields and better seed quality than earlier planting, the author points out. Rapid emergence and rapid growth should contribute to greater ease in weed control.

■ More than a bale per acre dryland cotton was produced by WILLIE WOODS, Quitaque, Texas, on the MARY OLLIE PERSONS farm. Sound management practices during dry 1954 were responsible for the good yield.

■ Brief . . . and to the Point

MAURICE R. COOPER and FRANK LOWENSTEIN emphasize the complexity of the cotton industry in a chapter in the latest Yearbook of Agriculture. The USDA authorities comment:

> "The marketing of the average U.S. cotton crop involves the distribution and utilization of some 6 or 7 billion pounds of fiber and 10 or 11 billion pounds of seed produced on about 1,100,000 farms in 17 or 18 states. No other agricultural product involves so many separate qualities, end products and separate marketing steps. Consequently, the marketing of cotton takes a larger share of the consumer's dollar and leaves to the farmer a smaller share than for most farm products."

Switch on Irrigation Pump Can Prevent Much Grief

Stationary farm power units, especially those on irrigation wells, must often operate unattended for many hours. Protective controls, properly installed, will safeguard the engine against burning out or severe damage.

Such controls, say Texas Extension agricultural engineers, include a high temperature cut-out switch which will shut down the plant when the temperature of the water in the cooling system reaches the danger point. They also point out that a cut-out switch is needed in the main oil pressure line which feeds the engine lubrication system. Such a switch cuts out and the engine is shut off when oil pressures drop below levels of safe operation.

Still another very desirable trouble preventer is a pressure unit installed in the pump discharge line. Engineers say in case of a line blow-out or if a pump loses its prime or fails for any reason to function, the engine is stopped because of the drop in line pressure.

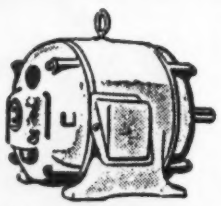
These cut-out switches operate on the ignition system of most engine units. However, in the case of diesel engines, the controls are designed to close the fuel valve and thus shut down the plant.

Pumping plant breakdowns are not only expensive from the standpoint of parts and labor required to get them back into operation but, more important, may also cause crop losses resulting from the failure to get water on the field at the right time. The engineers strongly believe that the old adage of "an ounce of prevention is worth a pound of cure" applies to equipping stationary engines with cut-out switches.

Engineering Station Report

Activities of the Texas Engineering Experiment Station for 1952-53 and 1953-54 have been summarized in Texas A. & M. College System Research Report 50. The report covers research activities and testing services.

SPARE MOTORS



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Cotton Insect Research

(Continued from Page 50)

This knowledge on the part of the farmer did not just happen. A tremendous amount of research and educational work was necessary to work out a satisfactory insect-control program and have it understood and practiced by as many farmers as are now participating in the program in Texas. Especially is this true in regard to the preventive phases of the program, such as early-fall destruction of cotton stalks and the application of insecticides for early-season control.

In my opinion the key to the successful program is cooperation, by many individuals and agencies. And yet the insect-control program in Texas or any other state is not perfect by any means. Much remains to be done, both in research and education. This is emphasized by the losses from insects that are still occurring. In spite of the better insecticides and improved methods of application in the last 10 years, insects are still taking a heavy toll.

According to the best estimates that are available, the value of cotton destroyed by insects in this country during the five-year period 1949-53 averaged $494 million per year. This loss creates a serious economic situation which can be remedied only by research and education. Approximately 77 percent of the loss was caused by the boll weevil.

• **Systemic Insecticides** — Perhaps the phase of research that promises the greatest return and that needs expanding most at the present time is the study of systemic insecticides. We are much encouraged over results obtained with them during the last five years, and yet very slow progress is being made toward developing a practical method of using these new powerful insect killers in the cotton field.

At present one systemic insecticide is recommended for foliage treatment but none for seed or soil treatment. Some of the systemics tested as seed treatments have shown outstanding promise in control of thrips, aphids, spider mites, and cotton fleahoppers, and some against the boll weevil.

The seed-treatment method appears particularly adaptable to the control of insects, including the overwintered boll weevil, attacking cotton in the seedling and early-fruiting stage. This method would have many advantages over the conventional spray and dust methods now being used in early-season control programs. Very few, if any, beneficial insects that live primarily on other insects would be killed, as sometimes happens when conventional applications are continued too long into the season.

Another advantage is that unfavorable weather and wet fields, which often prevent foliage applications from being made at the right time, would not interfere with the continued effectiveness of the systemic insecticides.

In a field experiment at Waco, Texas, in 1954 cotton grown from seed treated with the phosphorus compound American Cyanamid 12008 was compared to adjacent cotton grown from untreated seed. The cotton was planted on April 23. One month later the untreated cotton had 30 times as many thrips and 24 times as many aphids as the treated cotton.

By the first week in June, however, there was an injurious infestation of thrips in the treated as well as in the untreated cotton. Six weeks after planting, the treated cotton was almost twice as tall as the untreated cotton. Stunting and lack of growth of the cotton in the untreated plot was due mostly to thrips damage (See Figure 1). On July 7 the treated cotton averaged 2,620 blooms per acre as compared with 1,340 in the untreated check. It was evident from this experiment that the systemic compound was not sufficiently residual to give full protection against the heavy migration of thrips into the plots the first part of June.

The treatment also lowered the germination of the seed by 13 percent. In a similar field experiment at Tallulah, La., for some unexplainable reason, there was total loss of germination from the use of this insecticide.

• **Problems Ahead** — There are several problems which must be solved before the seed-treatment method can become practical. Three major ones will be mentioned.

1. Better methods of treating the seed need to be developed to prevent reduction in germination and injury to the seedling plants.

2. Much research needs to be done to extend the period during which systemics applied as seed treatments are effective, to give longer protection against all injurious insects and particularly against overwintering boll weevils.

3. We must also know whether undesirable residues are left in the seed and whether the fiber is affected.

Some of the other research problems that need attention are: insect resistance to insecticides; effectiveness of virus, fungi and bacterial diseases; screening of more new chemicals, including antibiotics; nutritional requirements of insects; insect resistance in plants; and physiology and biochemistry of cotton insects.

In view of the potential destructiveness of the pink bollworm, the over-all research program on this insect needs to be further expanded. The cotton industry is demanding that the threat imposed by this pest be alleviated. Quarantine and control measures developed as a result of research have done, and are presently doing, much to hold this pest in check. That they are not adequate to do the job under all conditions, especially under adverse weather conditions, is only too well illustrated by what happened in 1951 and 1952. Research, then, is our brightest hope of adequately coping with the pink bollworm problem.

Tomatoes, Our Favorite

Tomatoes are the favorite vegetables for Americans. Government statistics show that tomato consumption in 1953 averaged 53 pounds per capita. Corn ranked second, cabbage third, and peas ranked fourth in per capita consumption.

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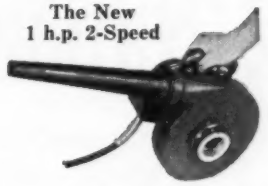

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MUSKOGEE IRON WORKS

Muskogee, Oklahoma

• Rotation Helps Make Land Stormproof

"IF WE could prevent storms, we'd have erosion just about licked. An average of four severe storms a year cause about 90 percent of our total erosion," A. P. Barnett, associate agricultural engineer, Georgia Experiment Station, Athens, says. "While we can't prevent the storms, research has shown us how to make Georgia farm land stormworthy.

"We can do it by sort of tying the soil down with organic matter by rotation of close -growing crops with row crops, after proper terracing and contour plowing, of course," he explains.

Measurements of runoff and soil loss on experimental plots at the Southern Piedmont Conservation Experiment Station at Watkinsville where erosion studies have been made continuously since 1938 prove these points. Begun by John R. Carreker, agricultural engineer, the tests are now carried on by Barnett.

Using continuous cotton as a check, research workers compared water runoff and soil loss of this planting on a seven percent slope with that of an identical plot where oats and lespedeza, volunteer lespedeza, and cotton were grown in a three-year rotation.

Soil loss on the plot planted to continuous cotton averaged nearly 25 tons per acre per year for a seven-year period. On the rotation plot when oats and lespedeza were the crops, soil loss was only 2.8 tons per acre and the next year, while the volunteer lespedeza was growing, it dropped to practically zero—only .24 ton per acre.

Small soil losses from erosion during these cover crop years were to be expected, but the significant point of the test came the third year when cotton was planted. Then soil loss increased only to 7.08 tons per acre—18 tons less than on the continuous cotton plot.

Build-up of organic matter in the soil from the oats and lespedeza which not only binds soil particles together, but prevents packing and crusting, thereby allowing surface water better entry into the soil, accounts for the difference, according to Barnett.

Importance of summer cover crops in rotation with cotton is increased by the fact that more erosion (52 percent) occurs during June, July and August than during the other nine months of the year, the agricultural engineer pointed out.

Also, residues of summer plantings of oats and lespedeza, even though dead, gave better protection to the land against fall and winter erosion than did winter cover crops of oats and vetch which are often erroneously thought of as being planted for erosion control during the winter, Barnett declares.

"On plots with an 11 percent slope, the three-year rotation of oats and lespedeza, volunteer lespedeza, and cotton did not give adequate protection," he explains, "but kudzu and sericea lespedeza, gave excellent runoff and erosion control on steep slopes, even when turned under occasionally for row crops."

He adds that the need for crop rotation to control erosion on even slightly sloping land was also shown in these tests. Continuous cotton land with only a three percent slope had an average loss of about 4.5 tons of soil per acre each year, while cotton with vetch planted after corn and crotalaria reduced this to 2.8 tons.

QUOTES FROM OUR AUTHORS

"Had the Pruetts or Thomas Coleman (winners of the 1954 Mississippi Five-Acre Cotton Contest) cut out any one of their prize-winning production practices, their yields would have been lower, of course. But the one recommended practice they could least afford to drop, the one which meant the difference between an average crop and a superior one was heavy—and proper — fertilization."—Russell Coleman.

Household Use of Butter And Margarine Is Up

Margarine purchases for household use during November 1954 were reported at 102 million pounds, up about 13 million pounds from November 1953, USDA says.

Butter purchases for the period were 66 million pounds, a gain of 11 million pounds over the same month in 1953.

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• Feb. 14—National Cotton Ginners' Association annual convention. Biltmore Hotel, Atlanta. Clifford H. Hardy, 400 Broad Street, Bennettsville, S.C., executive vice-president.

• Feb. 15-16 — Alabama-Florida Cotton Ginners' Association annual convention. Atlanta, Ga. Tom Murray, Room 410, Henry Grady Building, Atlanta, executive officer. To be held concurrently with Southeast Gin Suppliers' Exhibit.

• Feb. 15-16—Southeast Gin Suppliers' Exhibit. Biltmore Hotel, Atlanta. Sponsored by the Alabama-Florida, Carolinas and Georgia ginners' associations. For information write Tom Murray, Room 410, Henry Grady Building.

• Feb. 15-16 — Carolinas Ginners' Association annual convention. Atlanta, Ga. Clifford H. Hardy, 400 Broad Street, Bennettsville, S.C., executive secretary-treasurer. To be held concurrently with Southeast Gin Suppliers' Exhibit.

• Feb. 15-16—Georgia Cotton Ginners' Association annual convention. Biltmore Hotel, Atlanta. Tom Murray, Room 410, Henry Grady Building, Atlanta, executive vice-president. To be held concurrently with Southeast Gin Suppliers' Exhibit.

• Feb. 23-24—Oklahoma Cotton Ginners' Association annual meeting. Skirvin Tower Hotel, Oklahoma City. J. D. Fleming, 1004 Cravens Building, Oklahoma City 2, secretary-treasurer.

• March 8-9—Western Cotton Production Conference. Hotel Westward Ho, Phoenix, Ariz. Sponsored by Arizona Cotton Growers' Association, Southwest Five-State Cotton Growers' Association and National Cotton Council.

• March 14-15-16—Midsouth Gin Supply Exhibit. Midsouth Fairgrounds, Memphis. For information write W. Kemper Bruton, executive vice-president, Arkansas-Missouri Cotton Ginners' Association, P. O. Box 345, Blytheville, Ark. Arkansas-Missouri and Tennessee ginners' associations will hold annual conventions in connection with the exhibit.

• March 14-15-16 — Arkansas-Missouri Cotton Ginners' Association annual convention. Memphis. W. Kemper Bruton, P. O. Box 345, Blytheville, Ark., executive vice-president. To be held concurrently with Midsouth Gin Supply Exhibit.

• March 14-15-16 — Tennessee Cotton Ginners' Association annual convention. Memphis. W. T. Pigott, P. O. Box 226, Milan, secretary-treasurer. To be held concurrently with Midsouth Gin Supply Exhibit.

• March 18-19-20—West Coast Division, International Oil Mill Superintendents' Association, annual convention. Ambassador Hotel, Los Angeles. H. F. Crossno, 9065 Gainsford Street, Downey, Calif., convention chairman; H. E. Wilson, Wharton, Texas, secretary-treasurer.

• March 28-29—Valley Oilseed Processors' Association annual convention. Hotel Buena Vista, Biloxi, Miss. C. E. Garner, 1024 Exchange Building, Memphis, secretary.

• March 29-30—Midsouth Cotton Gin Operators' Schools for ginners of Arkansas, Louisiana, Mississippi, Missouri and Tennessee. To be held at locations in and near Memphis. Details will be announced later.

• April 3-6—National Peanut Council annual convention. Shoreham Hotel, Washington. William F. Seals, Dupont Circle Building, Washington 6, president.

• April 4-5-6 — Texas Cotton Ginners' Association annual convention. State Fair Grounds, Dallas. Jay C. Stilley, 3724 Race Street, Dallas, executive vice-president. For exhibit space, write R. Haughton, president, Gin Machinery & Supply Association, Inc., 3116 Commerce Street (P. O. Box 7985), Dallas.

• April 17-20—American Oil Chemists' Society annual meeting, Roosevelt Hotel, New Orleans. Mrs. Lucy Hawkins, 35 East Wacker Drive, Chicago, executive secretary.

• May 3-4—National Cotton Compress and Cotton Warehouse Association annual convention. Boca Raton Club, Boca Raton, Fla. John H. Todd, 1085 Shrine Building, Memphis, executive vice-president.

• May 17-18 — Oklahoma Cottonseed Crushers' Association annual meeting. Lake Murray Lodge, Lake Murray. J. D. Fleming, 1004 Cravens Building, Oklahoma City 2, secretary-treasurer.

• May 20-24—National Cottonseed Products Association annual convention. Jung Hotel, New Orleans. S. M. Harmon, 19 South Cleveland Street, Memphis, secretary-treasurer.

• June 2-3-4—American Cotton Congress. Harlingen, Texas. For information write Burris C. Jackson, chairman, Statewide Cotton Committee of Texas, Hillsboro.

• June 5-6-7 — South Carolina Cotton Seed Crushers' Association-North Carolina Cottonseed Crushers' Association annual joint convention. Fort Sumter Hotel, Charleston, S.C. Mrs. Durrett L. Williams, 609 Palmetto Building, Columbia, S.C., secretary-treasurer, South Carolina association. Mrs. M. U. Hogue, P. O. Box 747, Raleigh, N.C., secretary-treasurer, North Carolina association.

• June 5-6-7—Texas Cottonseed Crushers' Association annual convention. St. Anthony Hotel, San Antonio. Jack Whetstone, 624 Wilson Building, Dallas, secretary.

• June 7-8-9—Tri-States Oil Mill Superintendents' Association annual convention. Edgewater Beach Hotel, Biloxi, Miss. Roy Castillow, Southern Cotton Oil Co., Little Rock, Ark., secretary-treasurer.

• June 13-16 — International Oil Mill Superintendents' Association annual convention. Lubbock Hotel, Lubbock. H. E. Wilson, P. O. Box 1180, Wharton, Texas, secretary-treasurer.

• June 20-21—Alabama-Florida Cottonseed Products Association and Georgia Cottonseed Crushers' Association annual joint convention. Edgewater Gulf Hotel, Edgewater Park, Miss. T. R. Cain, 322 Professional Center Building, Montgomery, executive secretary, Alabama-Florida association. J. E. Moses, 318 Grand Theatre Building, Atlanta 3, secretary, Georgia association.

• June 23-24 — Mississippi Cottonseed Crushers' Association forty-fifth annual convention. Hotel Buena Vista, Biloxi. For information write 207 One Hundred East Pearl Building, Jackson.

• July 6-7-8—Oil Mill Operators' Short Course. Texas A. & M. College, College Station. For information write Dr. J. D. Lindsay, head, department of chemical engineering, Texas A. & M. College, College Station.

• Sept. 7-8-9—Beltwide Cotton Mechanization Conference. Texas A. & M. College, College Station, Texas, and Blackland Experiment Station, Temple, Texas. For information write National Cotton Council, P. O. Box 18, Memphis 1.

Short Course Planned On Fiber Testing

Cotton Economic Research, a research unit sponsored by the Cotton Research Committee of Texas and located at the University of Texas will conduct its sixth annual short course beginning April 11, 1955.

The course will last four weeks and will cover the use of fiber testing instruments and interpretation of data. Instruction will be given on the use of instrument measurements in merchandising cotton, the detection of operational difficulties in fiber testing instruments and their correction, and the limitations of the instruments.

Tolerances for specific fiber instruments and how tolerance may be used in cotton trading will be discussed. Work will be done on sampling methods designed to show the variation in fiber properties of cotton from specfic areas and in lists of "even-running" cotton.

Visits will be made to nearby cotton mills and to the USDA laboratory at College Station. The eighth annual Cotton Merchandising Clinic, scheduled for May 6 and 7, comes at the conclusion of the four weeks' course.

The tuition fee is $100, not including living expenses. It is suggested that students arrive the weekend before classes begin on Monday, April 11.

For information write Joel F. Hembree, Cotton Economic Research, P. O. Box 8020, University Station, Austin.

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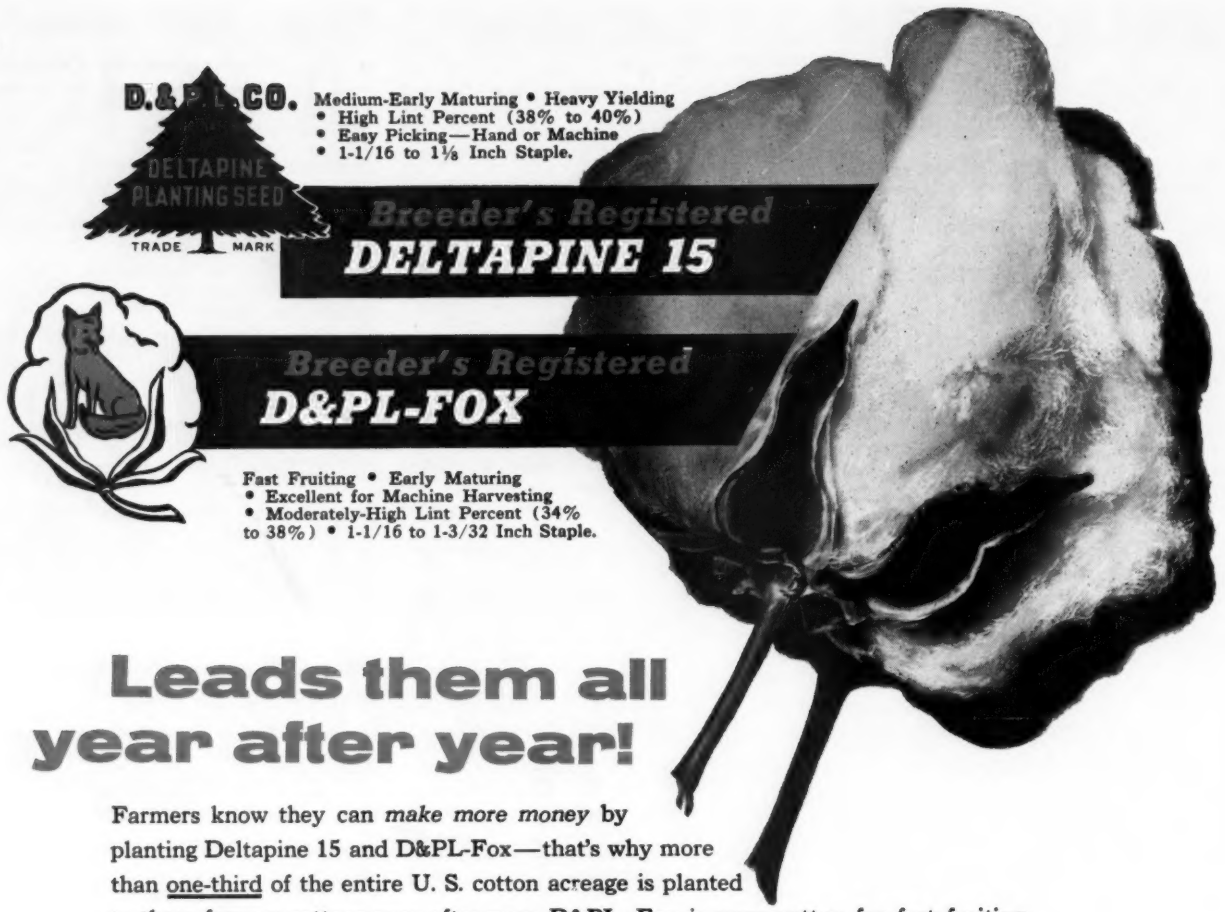
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Medium-Early Maturing • Heavy Yielding
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Fast Fruiting • Early Maturing
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BREEDERS OF THE BELT'S BEST COTTONS

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The best way to get a job done is to give it to a busy man. He'll have his secretary do it.

• • •

A haughty dowager called at the hospital to see her injured chauffeur. The nurse said, "He's a very sick man. Are you his wife?"

The dowager replied, "Certainly not! I'm his mistress."

• • •

Drill Sergeant: "A soldier should never lose his head while under fire. Why?"

Rookie: "Because that would leave no place to put the helmet."

• • •

"Do you understand that you are expected to tell the court the truth?" the judge asked the defendent.

"Yes, sir," said the defendent.

"And do you know what will happen if you don't tell the truth?" the judge continued.

"Well, I'm not so sure about that . . . . my lawyer said that we'll probably win the case."

• • •

A married man knows there are three sides to every question: his side, his wife's side, and to hell with it.

• • •

Two friends went duck hunting one day this fall, one taking a jug of coffee and the other a bottle of Old Hale and Hearty.

Both imbibed freely of their chosen beverages for several hours before a single duck appeared.

The coffee drinker raised his gun, fired, and missed. The other shot once and brought the duck down.

"That's pretty good shooting," said the coffee drinker.

"Nothin' to it," said the other. "When there's a flock like that, you're bound to get one of them."

• • •

We hear that statisticians find that nine out of ten women are knock-kneed . . . . and for years we've been thinking that statisticians never have any fun.

• • •

A near-sighted man was walking along a street one day when a parrot flew into his range of vision. Thinking that he might catch it for a pet, he made a wild grab for it, but missed.

The parrot ruffled its feathers and, from a distance snapped: "What do you think you're doing?"

"Beg pardon," said the near-sighted man, "I thought you were a bird, sir."

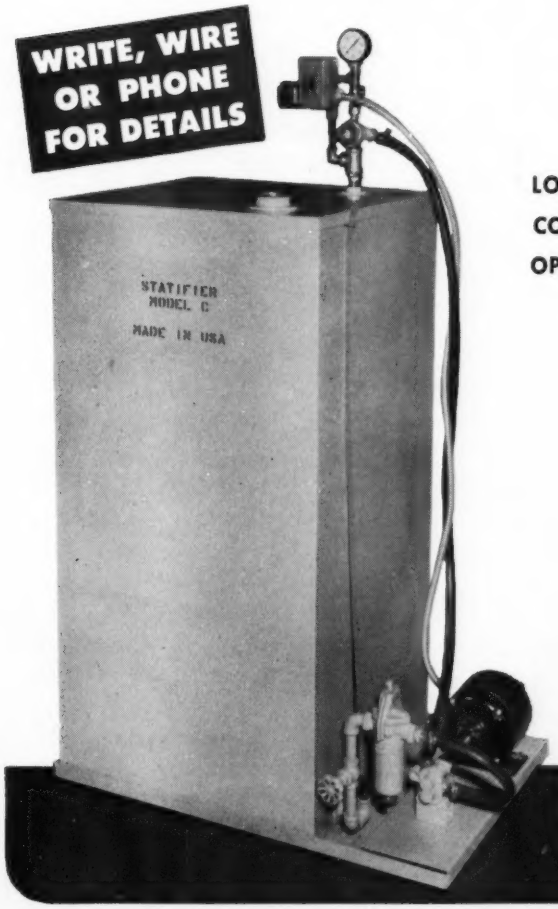
How Kemgas Statifier Cuts Costs And Boosts Gin Production

Experienced ginners everywhere know the advantages of moisture in baling cotton. It makes pressing simpler. It enables the press crew to keep up with the production of the largest gins. Losses from broken ties are practically eliminated and press repairs are at a minimum. Adding controlled moisture is no longer a problem. The Kemgas Statifier sprays an automatically controlled mist of "wet water" . . . 8 pounds or less to the 500-pound bale. The instant the batt of cotton comes from the condenser it tilts a metal control flap mounted across the lint slide closing a mercury switch that starts and controls the gentle mist spray over the batt.

Uniform Penetration with MOYST Agent

As long as the condenser delivers cotton to the slide, the Statifier responds with its controlled mist. Breaks or gaps in the batt releases the control flap which automatically stops the mist. Very little water is needed for a 500-pound bale because a special MOYST wetting agent is used in the Statifier. This permits the slight moisture used to uniformly penetrate all of the cotton in the bale. Only one pint of this wetting agent is used in 50 gallons of water, costing between 1 and 2 cents per bale.

WRITE, WIRE OR PHONE FOR DETAILS



LOW VOLTAGE CONTROL FAITHFULLY OPERATES NEW STATIFIER SERIES

The mist control systems of the new STATIFIER series are now operated by a 24-volt unit. It is a simple and quick installation and complies with National Electrical Code requirements. The 100-gallon tank in which the MOYST wetting agent is added to the water, is of 18 gauge galvanized steel. The ¼-horsepower motor is totally enclosed. The pressure pump is of bronze and stainless steel, and there is now a quick opening cover on the large-capacity strainer to simplify cleaning the screen.

MODEL CL For use only at lint slide before cotton is pressed. Has automatic electric control for mist unit.

MODEL CLL For use at lint slides of double battery gin. Has one motor, pump and tank, but two mist units and controls.

MODEL CD For use only at point where seed cotton drops into conveyor distributor before it is ginned. Has automatic electric control for mist unit.

MODEL CLD For use at both lint slide and distributor. Mist units have separate automatic controls.

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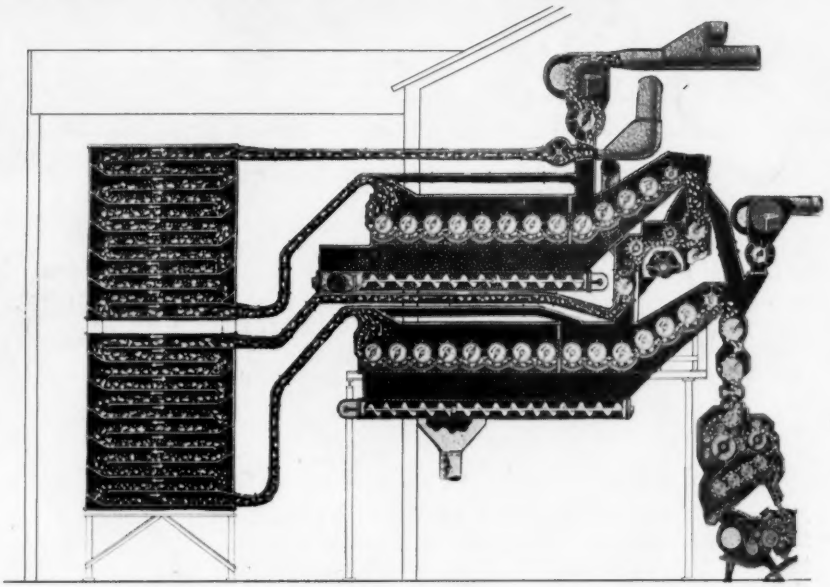

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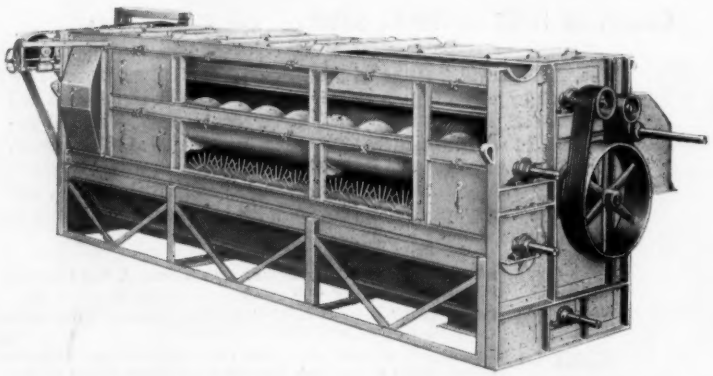

EXTRACTION FULL LENGTH OF SAW CYLINDER

Trash discharge or Moting Space extends FULL LENGTH directly under Saw Cylinder. This feature eliminates Cylinder dragging through accumulated trash at this point, and affords maximum capacity without loss of cotton.

Write for Bulletin No. 34-B

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